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MAY 2000

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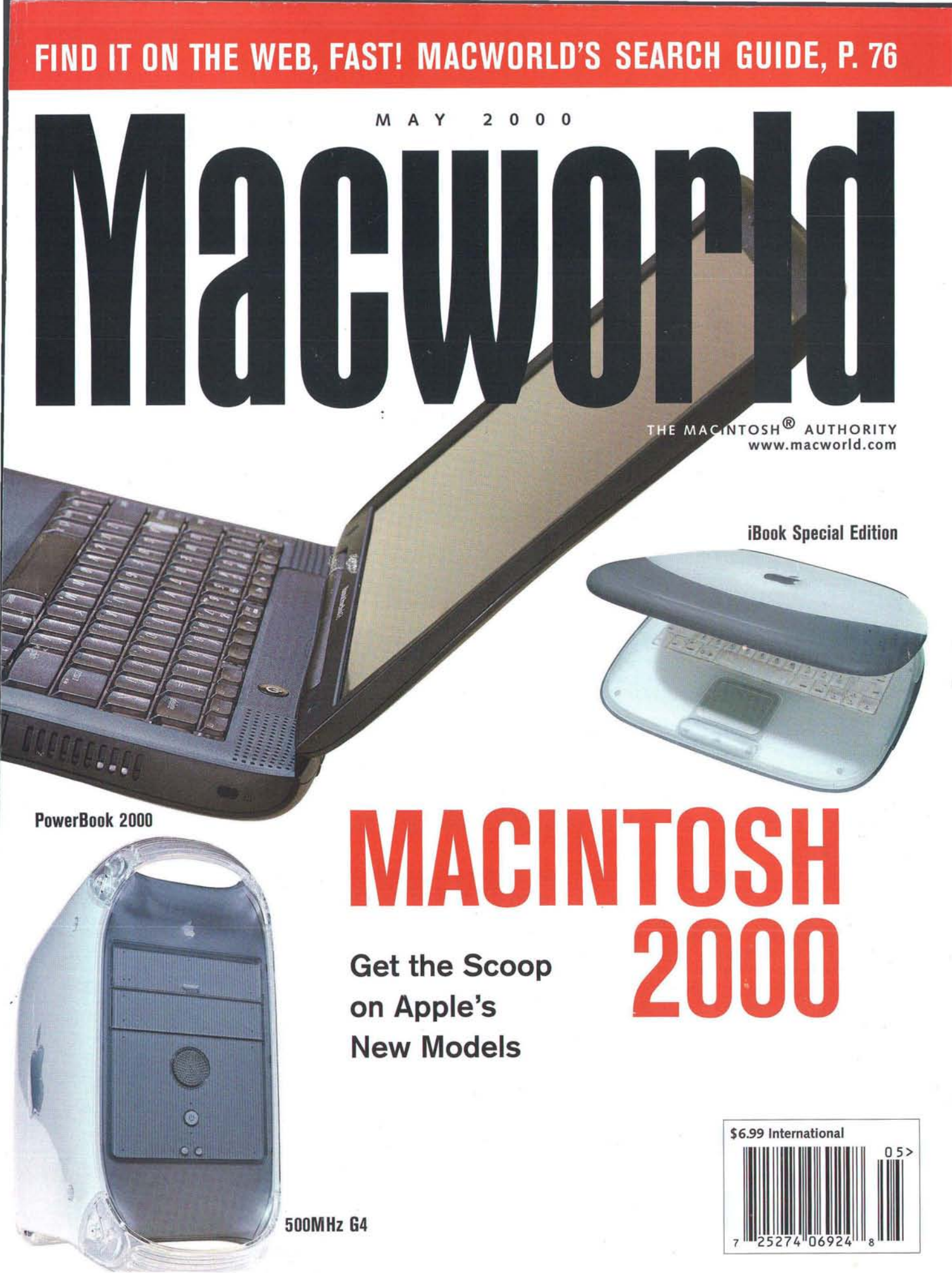

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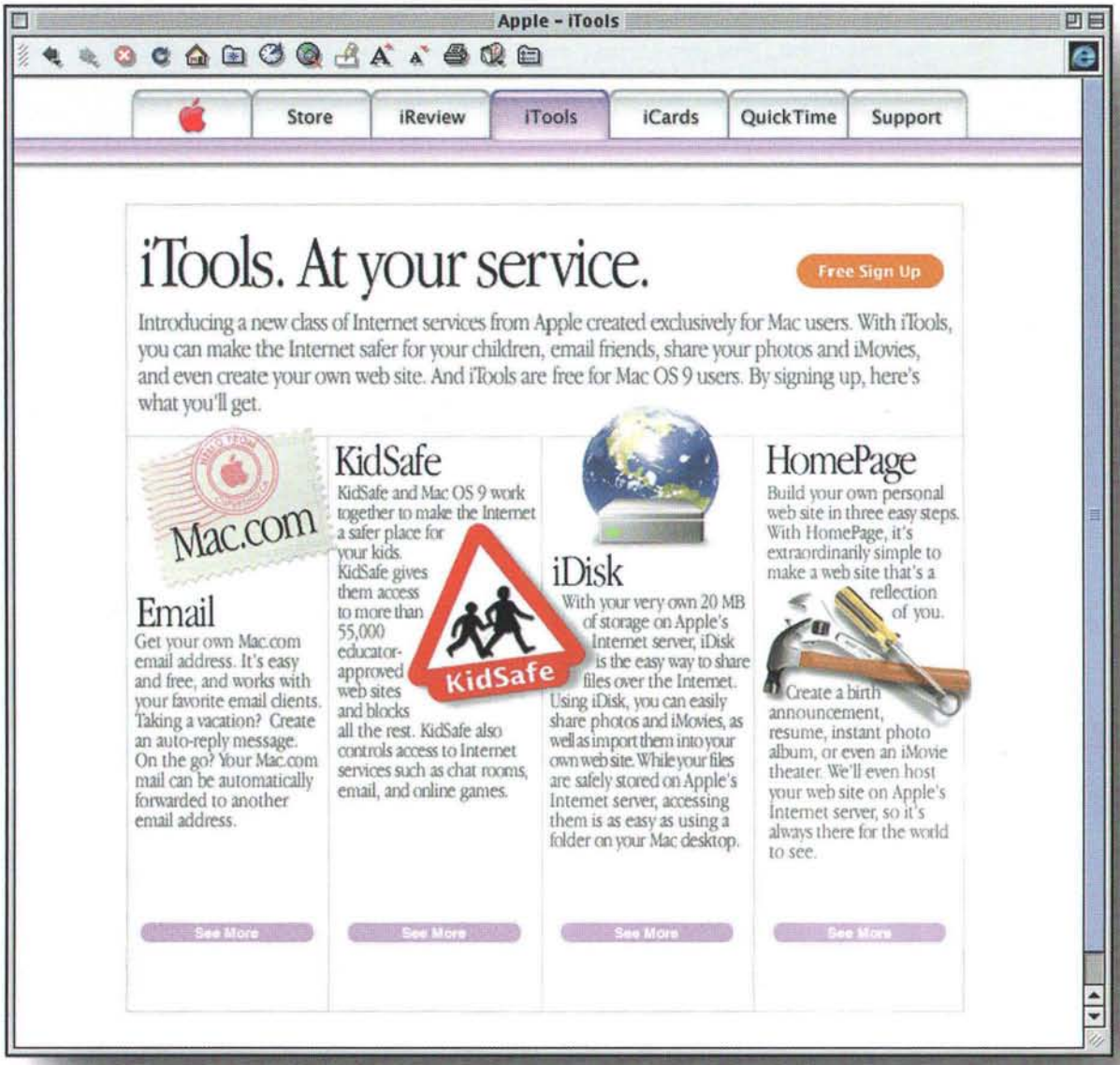

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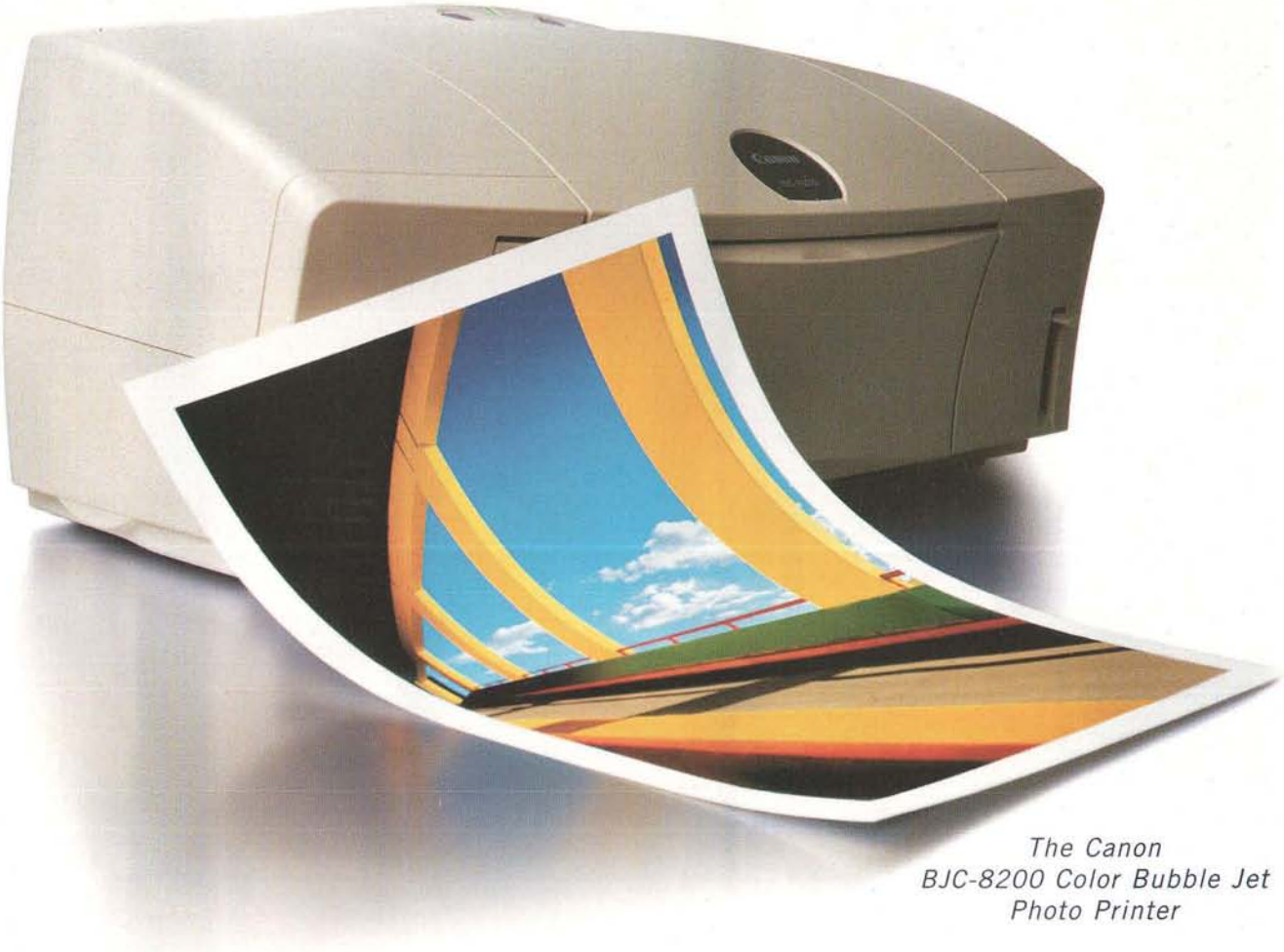

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Photos in Minutes

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Picture-Perfect Quality

1,536 nozzles apply microfine ink drops just 4 picoliters in size to create unprecedented tonal scale and complex detail.

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Unlike our competitors, this is not the first device we've made for photographers.

Introducing our latest innovation for photographers: The BJC-8200 Color Bubble Jet™ Photo Printer with 1200 x 1200 dpi resolution. Combining Canon's exclusive MicroFine Droplet Technology™ with a 1,536-nozzle printhead, the BJC-8200 gives you the freedom to print professional-quality 8" x 10" prints at your leisure. In approximately three minutes.* And using Canon Photo Paper Pro in concert with our six-color ink system, you'll get rich, glossy output that rivals the results of photo labs. In other words, we've just brought the darkroom to your desktop.

The perfect solution for any photography enthusiast, the BJC-8200 is compatible with both Mac® and PC computers. But most important, it's the only photo printer from a company that knows a thing or two about photography. For more information, visit our Web site at www.BJC8200.com or call 1-800-OK-CANON.

Canon KNOW HOW™

1200 x 1200 Resolution

The BJC-8200's razor-sharp 1200 x 1200 dpi resolution is nearly 40% higher than ink jet printers with 1440 x 720 dpi.

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With the Canon Think Tank System,™ you'll save money for years to come by replacing ink tanks individually, instead of wasting the entire cartridge.

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What Canon engineers have to say about the CanoScan® FB 1200S scanner:

Technically speaking, the CanoScan FB 1200S owes its ultra-high resolution to an advance in scanning technology called VAROS™ (Variable Refraction Optical System). With VAROS, the FB 1200S achieves true optical 1200 x 1200 dpi resolution in a compact, desktop size and at a breakthrough price.

The technology involves two passes. On the first pass, the FB 1200S captures data at 600 dpi. On the second pass, VAROS refracts the optical path by half a pixel. Next, a synthesis of both passes is made, resulting in brilliant tones, real 36-bit color depth, and sharp, vivid, real 1200 x 1200 dpi scans.

To capture subtle differences in tone gradation, the FB 1200S has a high 3.3 density range. And a dual-platform SCSI interface card is included for the quick transfer of large files. To interface with Canon, call 1-800-OK-CANON or log on at www.canoscan.com.

The CanoScan FB 1200S Color Flatbed Scanner

Canon KNOW HOW™

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Canon's exclusive VAROS technology delivers true optical 1200 x 1200 dpi resolution.

Dynamic Color

The CanoScan FB 1200S achieves real 36-bit color depth for a superior dynamic range of 3.3.

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What the critics are saying:

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~ Jim Seymour, PC Magazine 9/21/99

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Performance Software

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Macworld

Incorporating MacUser

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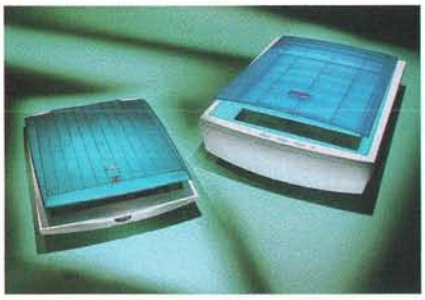

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50 ♦♦½ **Watch & Smile**
Photo-retouching and multimedia tool

50 ♦♦♦½ **DHCP Server 6.5**
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52 ♦♦♦♦ **Starry Night**
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58 ♦♦♦½ **Star Wars: Episode 1 Racer**
Arcade game

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At The Virtual Printer Store you buy your printer direct from the people who made it. So you pay only for what you need (the printer), and not what you don't (the middleman).

And there's another important difference after you leave. At conventional stores you get demoted from customer to stranger. At ours you become a virtual client.

We offer unlimited technical support 24 hours a day, 7 days a week – for the entirety of the one-year warranty. And if you run up against a problem we can't solve, our Platinum Exchange Warranty Program guarantees you a replacement printer by the next business day. (All our printers come with a thirty-day, money-back guarantee as well.)

Finally, we offer printers good enough to sell themselves – because they have to. Printers that turn out vivid halftones, poster-sized graphics, printshop-quality text, and perform various other noteworthy feats noted below.

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35 PostScript fonts, 15 PCL fonts,
45 downloadable fonts
RAM expandable to 64 MB
1st year Platinum Exchange
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USB, Ethernet (10 BaseT),
Bi-directional Parallel

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45 downloadable fonts
RAM expandable to 64 MB
1st year Platinum Exchange
USB (cable included),
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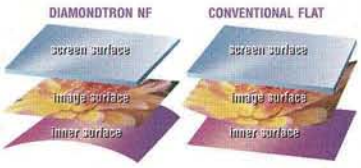

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PC WORLD WORLD CLASS — Diamond Pro 900u July 1999

Macworld EDITORS' CHOICE — Diamond Pro 2020u June 1999

CADENCE LAB verdict — Diamond Pro 2020u June 1999

PC MAGAZINE EDITORS' CHOICE — Diamond Pro 900u Jan. 19, 1999; Best 19" upgrade March 9, 1999

1998 Eddy WINNER MCWF — Diamond Pro 900u March 1999

Desktop Publishers — Diamond Pro 900u February 1999

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Job Opportunities

Web Designers • Washington DC • Web Designers please respond if you dream in Photoshop and Illustrator, were born to Flash dance, can HTML or DreamWeave blindfolded with one hand tied behind your back, and can play Quark better than B.B. King can play the blues. Last but not least you must be able to submit an online portfolio dressed to impress.

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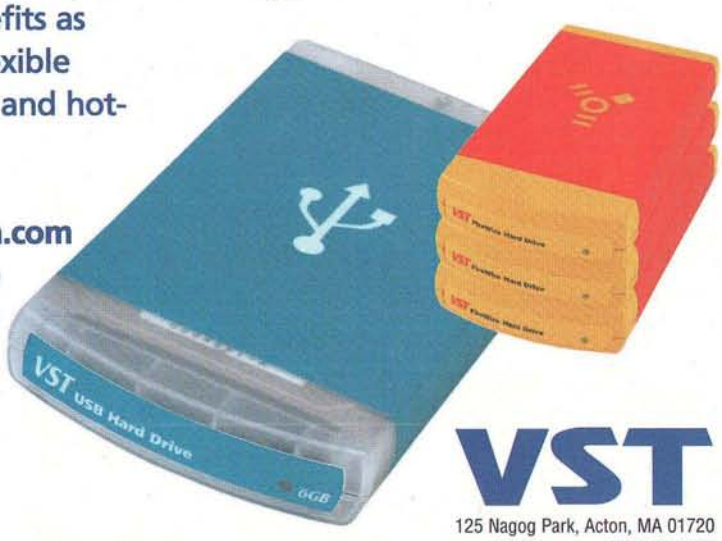

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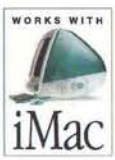

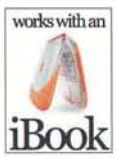

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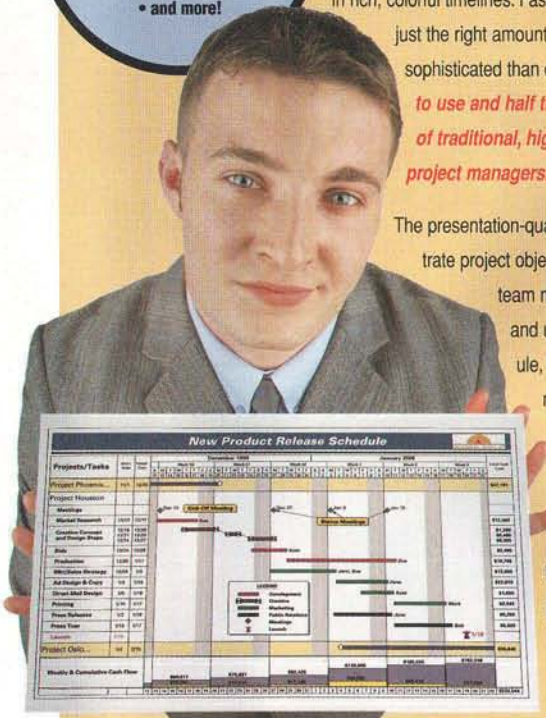

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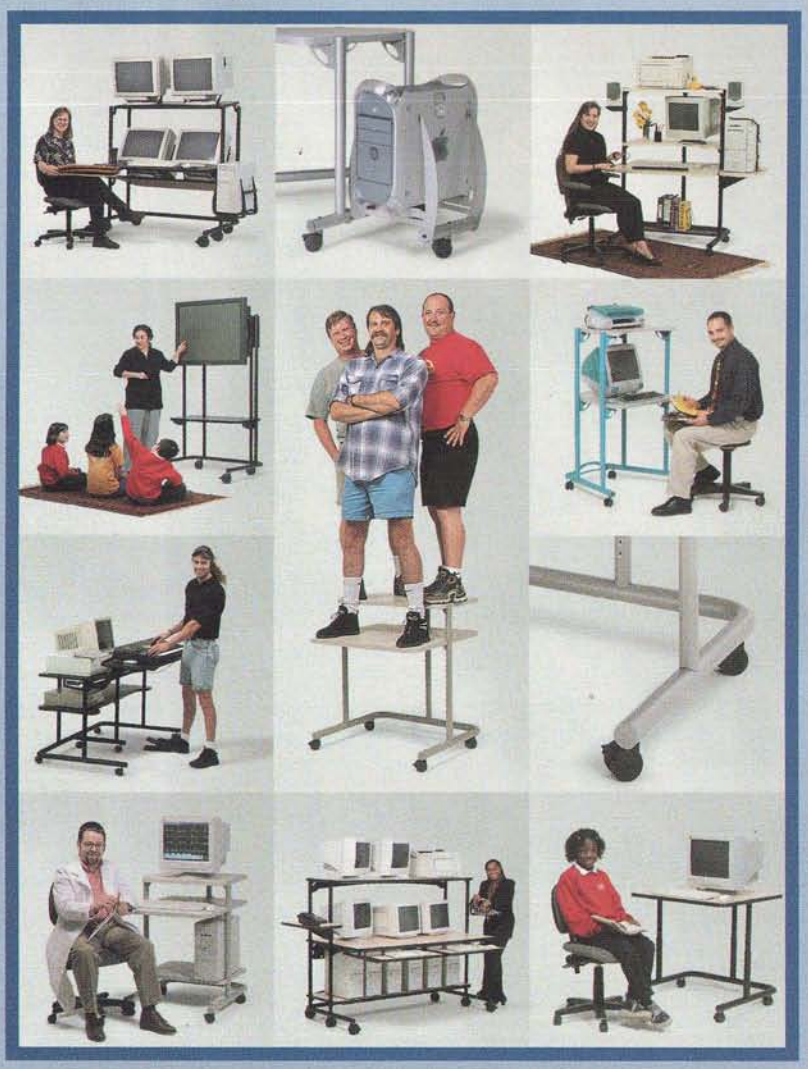

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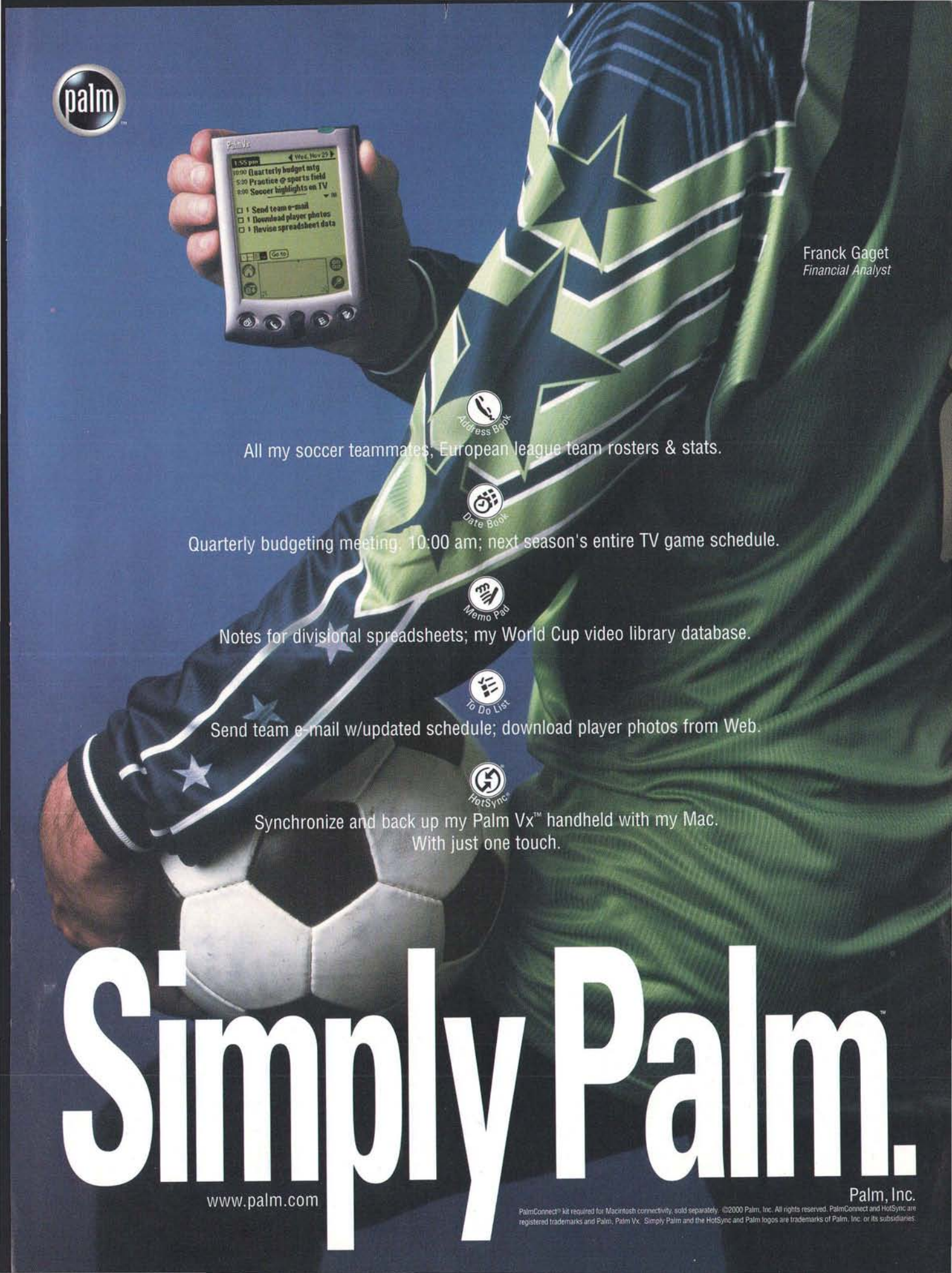
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MAY 2000

Letters

Forget Those MP3 Players

I RECENTLY READ *MACWORLD*'S ARticle about MP3 players ("MP3 to Go," February 2000), and I don't see that portable MP3 players are practical yet. Unless you're looking for the latest gadget, they aren't worth the plastic and metal they're made of. You can barely get any music on the meager amount of RAM they provide, and the expandable flash cards are very expensive.

Personally, I am sticking with MiniDiscs. I bought a recorder and a player for under $300, and I hooked the recorder up to my stereo and my computer. It's the best thing I've ever had. I never have to worry about encoding, file formats, or download time. If my computer or stereo can play it, I can record it. The player is about the size of a portable MP3 player, and the discs are $3 to $5 each and come in 60- or 72-minute lengths.

Please let people know about alternatives before they get trapped in the expensive world of portable MP3 players.

PERRY KRUG
Glen Head, New York

Fireworks or Bust

I WAS PLEASANTLY SURPRISED TO see *Macworld*'s two-page spread on Macromedia's Fireworks 3 ("Fireworks 3 Fights Back" in "Wake Up Your Web Sites," February 2000), but I knew to expect ill-informed comparisons to Adobe Photoshop and poor explanations of Fireworks' stellar new features.

Still, I am constantly amazed by the tenacity of die-hard Photoshop fans. Yes, Photoshop is a good tool—a good *print* tool—but no matter what add-ons and combinations Adobe rolls up into its big, expensive image-editing application, nothing beats Fireworks for Web graphics creation and production.

Often, Kathryn Lunsford compared Fireworks' features to Photoshop's in a second-cousin, cheap-imitation kind of way. And the Fireworks sidebar showed that she doesn't really use Fireworks. Contrary to what she wrote, tools for editing bitmapped images existed prior to version 3; they just didn't look like Photoshop's. Also, you cannot use Photoshop's Spherize filter within Fireworks, not even in the new version.

Many people say I am a fanatic Firebug, and they're right. Macromedia really has its act together.

DONNA CASEY
Oakland, California

While it's true that bitmap image-editing tools such as Sharpen and Brighten were available in earlier Fireworks versions (through the Xtra menu), these functions were quite limited.—Kathryn Lunsford

AirPort Review Doesn't Fly

MACWORLD'S REVIEW OF THE AIRPort was incomplete and lacked hard facts (*Reviews*, February 2000). For one thing, the article made no mention of IEEE 802.11, the wireless standard on which the AirPort is based, or of Apple's claims that the AirPort is compatible with other IEEE 802.11 products. An actual test of the AirPort's ability to work with other 802.11 products would have been very valuable.

Furthermore, your testing process seemed vague. What does "marched around a large office and took an elevator down one floor" mean? You didn't give any details or address how obstructions affected the AirPort's performance.

I understand that you're limited by the time and the space you have for a product review, but that is no excuse for one that lacks real data. Next time, try spending more time doing a useful review instead of just playing with a cool new toy.

JAMES L. SCHEK
Sacramento, California

Left-Hand Discrimination

MANY COMPANIES, INCLUDING Microsoft, are making state-of-the-art mice (*Reviews*, February 2000), but few of them are designed for people who are left-handed.

I use a right-handed mouse with my left hand in order to take advantage of its scrolling feature, which isn't available for lefties. While it's not unusable, certain maneuvers are quite awkward.

Now the latest mouse breakthrough—Microsoft's optical tracking system—caters only to the right-handed. But your

continues

DAVE CUTLER

review of the IntelliMouse Explorer makes no mention of this, even though the problem affects millions of people.

BEN THIELSEN
Staten Island, New York

What's the Password?

JOSEPH SCHORR'S ARTICLE ON keeping track of passwords was a nice read ("Battle Password Amnesia," *Secrets*, February 2000). The "set it and forget it" mentality that so many people employ often comes back to haunt them when they're not in their usual environment.

But I found it shocking that he suggested using a random word from a book or dictionary as a universal password. The problem with that is obvious: someone who learns that one password then knows them all, and hackers often use dictionary programs to crack passwords. Some systems won't even let you use a real word as a password, and I don't see why Mac users should be any less diligent.

I'd like to offer a method for remembering passwords that has served me well for over ten years: acronyms related to the access point in question. For example, with an animal-care Web site, you could make up a phrase based on the names of your cats, such as: "Dusty and Mittens are two healthy kittens." Reduce that to *DaMathk* (choose your own case sensitivity), and you have a secure password. You can also make substitutions in obvious places—*two* becomes 2 and *for* becomes 4—to improve security. Ugly? You bet. Memorable? I've yet to forget one.

JOE CREIGHTON
Starbuck, Manitoba, Canada

Perils of This Modern Life

PLEASE TELL ME ANDREW GORE IS kidding ("Time Bandits," *The Vision Thing*, February 2000). If he's not, then I have to assume he's bought the hype. The media would have us believe that life is becoming increasingly more difficult and complicated—certainly much tougher than the lives our parents and grandparents led. And Gore takes the bait: "Our lives are complex, and they're getting more complex by the minute. Work, family, friends, hobbies, travel—the slate is very full, and that's before you add in all the things that technology enables us to do."

Since when does enjoying greater speed and efficiency equal having less time? We all make choices for our own lives, and nobody makes us use iMovie, surf the Web, produce newsletters, or anything else.

Gore says we're running out of time to enjoy our lives. Nonsense. What we're running out of is the courage to take responsibility for how we spend our own lives.

DOUGLAS R. KELLY
Silver Spring, Maryland

I JUST READ GORE'S FEBRUARY COLumn, and I found it reassuring. Technology lets us do more things more easily and faster than we could ever imagine. But while I like my iMac, I harbor misgivings about technology. I am a commercial photographer, and computers have allowed me—*forced* me might be a better way to put it—to close my studio, work from home, and fire my assistant and my studio manager. Is my life better? Not much, if at all. I just have to work faster, harder, and cheaper. If anything, I am achieving a level of mediocrity that I find reprehensible. My photographs are no better for all the new technology.

Computers allow us to do things we never thought imaginable just a few years ago. But often the quality of what we produce suffers when we strive to do it faster and cheaper. Just because you *can* do something doesn't mean you *should*.

JAMES BURT PITTMAN
Southaven, Mississippi

Internet Games for the Rest of Us

SINCE WE'RE PROBABLY OF ABOUT the same generation as Christopher Breen's parents, we appreciated his column about more-traditional games (*The Game Room*, February 2000). However, we would like some clarification about the ability to play some of these games over the Internet. Sierra's Web site says that Internet play for its games is not available on the Mac.

Did Breen actually play these games over the Internet on a Macintosh? If it's possible, why is this capability not available to us?

RICH AND NOEL DE LUNA
Blue Ridge Summit, Pennsylvania

Sierra claims to be working with WON.net to make its Mac games Internet-playable, but this feature, if offered, won't be implemented until after the fall of 2000.—Christopher Breen

DAO Nearly DOA

YOUR RECENT REVIEW OF TOAST 4.0 Deluxe (*Reviews*, February 2000) inspired me to buy it. The disk-at-once (DAO) feature, which allows users to blend tracks together without pauses, was one of the clinchers for me. However, I find it strange that you fail to mention Adaptec's poor documentation on how DAO works. There is no DAO setting named as such within the Toast application. My first attempt to write a DAO CD-R led to system errors and other glitches. I have seen many postings complaining about DAO on user forums.

I think Toast 4.0 Deluxe is a good value and has many new and useful features. However, Adaptec must resolve users' problems with the DAO feature.

ROY HONEGGER
Lake Zurich, Illinois

Macs Not Welcome Here

I'M WRITING ABOUT AN ALARMING observation I've made. Despite the promise of a platform-independent Internet, I have discovered many online services that are not Mac compatible.

For example, the government of Oakland, California, has started a program called Crime Watch. Users can log onto the Web site and get detailed crime statistics. But I can't access the site—I'm told I'd have to buy Windows to do so.

Then I found out that my bank, Wells Fargo, has decided to drop Macintosh development for business services such as direct deposit. Our office is out of luck unless—again—we buy Windows.

Now I hear that by 2002, more California government services will be available online. My fear is that these services will also require Windows.

I hope people will pressure the government and private companies to develop truly platform-independent services.

GREGORY L. KLOSOWSKI
Oakland, California

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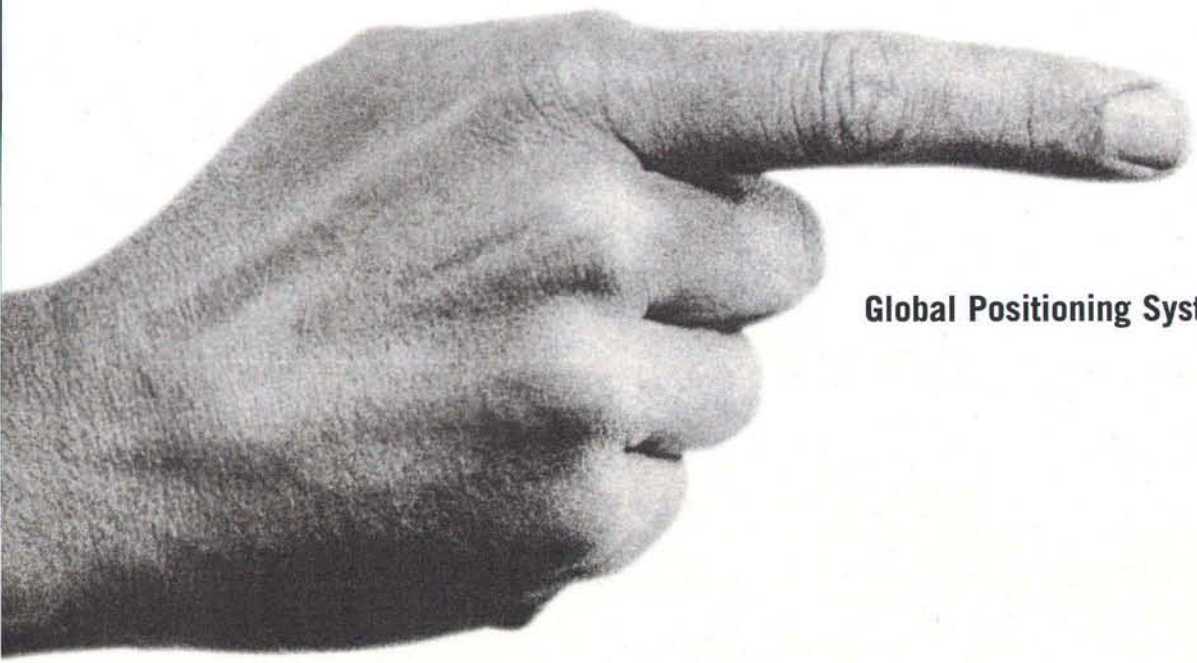

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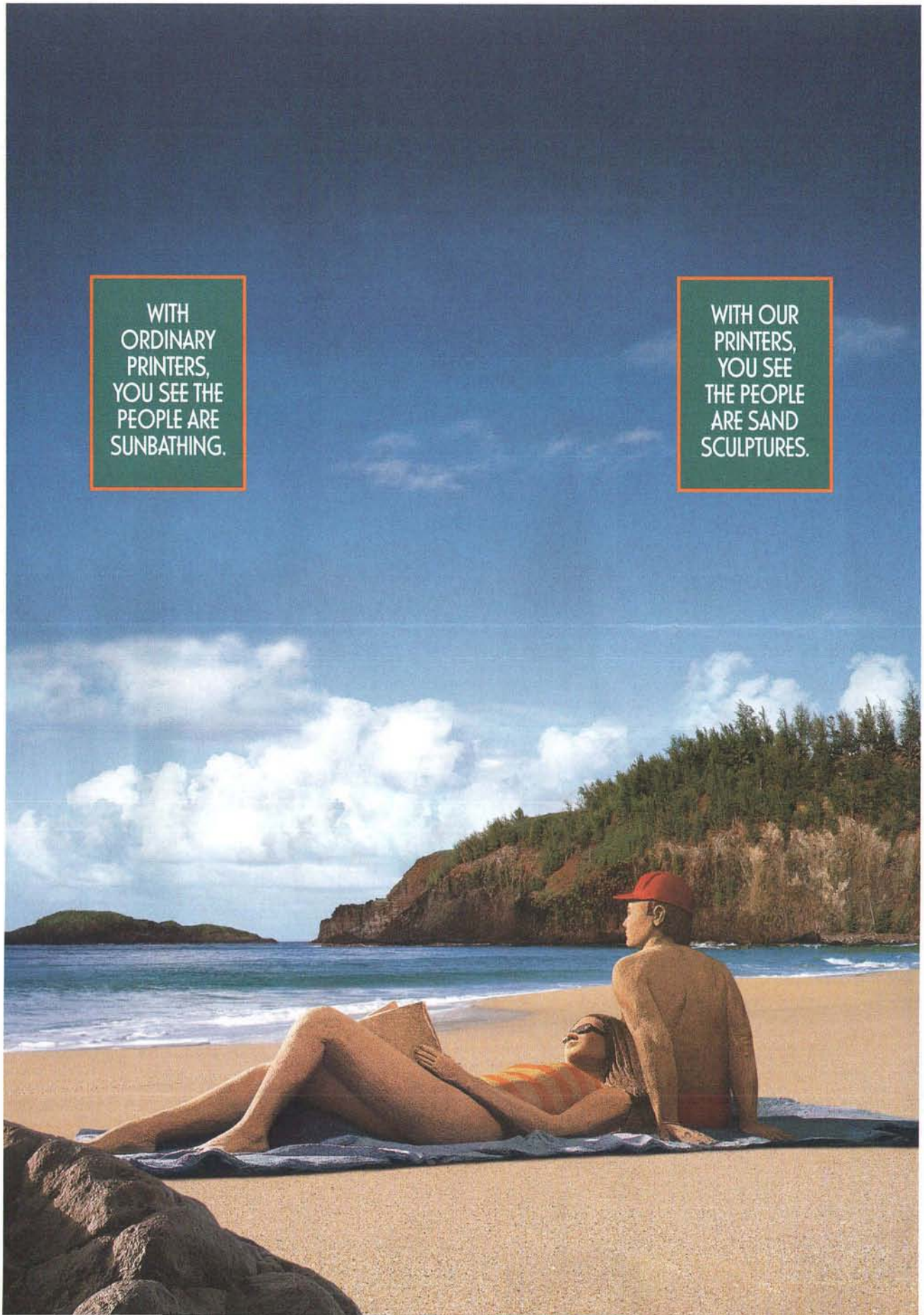
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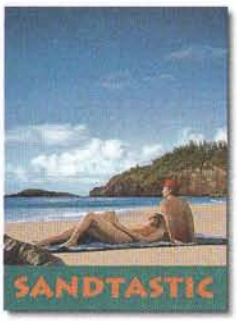

It's true. The couple enjoying the sand is actually made from it. As are their clothes, glasses and book. Even the blanket they're lying on. It's all sand. Meticulously sculpted, painted and photographed to fool the eye. So when the artists who created this difficult illusion wanted to reproduce it for a brochure, there was only one printer they could trust with the job. An Epson. As you can see here, it captured not just the vibrant color of the setting but also the incredible detail in the sculptures. And turned what could have been a nightmare of a project into a day at the beach.

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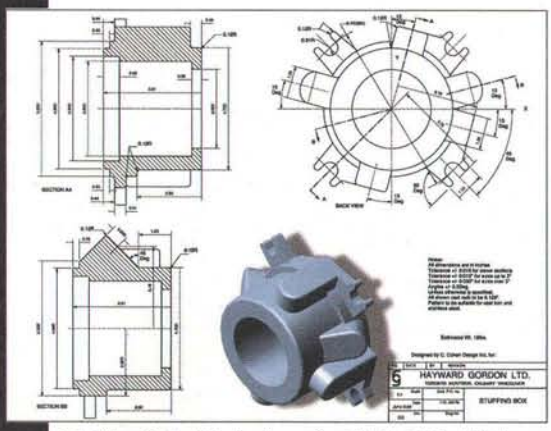

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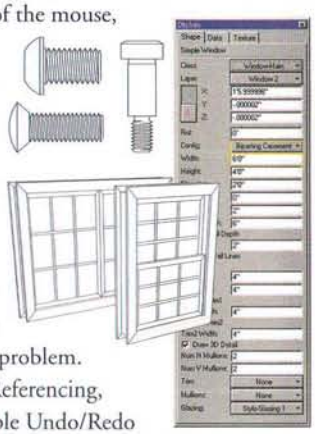

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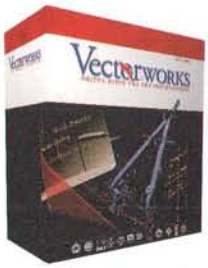

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The Vision Thing

by Andrew Gore

The Golden Age of Wireless

A NETWORKED HOME ISN'T JUST FOR SHOW—IT CAN HELP YOU GET REAL WORK DONE

WE HERE AT *Macworld* have a theory. When it comes time for Apple to introduce a new product, the product managers sit down with a copy of our editorial calendar and figure out when the absolute last possible moment is for us to get the story into our next issue.

Then they set the introduction date for the next day.

Since Apple no longer briefs publications in advance of new products, we've had to come up with contingency plans to deal with last-minute debuts such as the one we cover in this month's issue.

But, as thorough as *Macworld*'s planning is, something we didn't plan for was how critical my modest little home network would be in getting this month's cover story to you.

A Simple Plan

My journey into the world of home networking started simply enough: I moved into a new house. When we moved into our charming little slice of Silicon Valley, just a stone's throw from Apple's corporate headquarters, one of the first things we did was get high-speed DSL Internet access installed. That, of course, led me to wonder what I could do with all that bandwidth.

First, I knew I'd want to get all the computers in the house on a single network so they could share our speedy Internet access. Easy enough—I'd just run some Ethernet cable between rooms, then hook up a hub in the closet, and maybe even use an old iMac as a server.

That was last summer. My network wasn't up and running until just before New Year's Eve (for the complete saga, check out the ongoing series "Andy's Adventure Underground" at www.macworld.com/columns/gorey_details).

As it turned out, setting up the iMac was the easy part—the problem was running the wires. I couldn't find anyone willing to install Ethernet cable for me. And I soon found out why: pulling the cable through the crawl space of my house was one of the most unpleasant experiences I've ever had, and I lived through polyester leisure suits, pet rocks, and disco all in the same decade.

Wires? They're So 20th Century!

Luckily for me, right around the time I gave up on having an Ethernet port in every room, Apple's AirPort technology arrived. So I installed an AirPort base station and hooked it to the network.

AirPort is a miracle. With the addition of $190 Lucent WaveLAN Turbo PC Cards to our PowerBooks and an AirPort card to our iMac DV, we could access our home network—including our printer and file servers—from anywhere in the house. Even with several computers accessing the hub at the same time, it was fast—much faster than our DSL connection was capable of supporting. About the only time I noticed any lag was when copying large files between computers. There, 10BaseT Ethernet still holds the advantage. And because all the computers accessing the network via the AirPort hub can share the same IP address, we didn't have to pay our ISP for any extra IP addresses.

Within a couple of hours, AirPort succeeded in completing the job that had taken me six months to begin. And AirPort did it for less. The cost of a $299 hub and some $99 Apple AirPort cards was minuscule next to the hundreds I'd spent on cable, tools, and jacks—and the cost of my time spent under the house running Ethernet cable.

GoreNet to the Rescue

But it wasn't until Apple's recent introduction of the 2000 model PowerBook that I really began to appreciate the power of the infrastructure I'd built in my home. My house is close to Apple, and *Macworld*'s offices aren't. Rather than waste a precious hour driving back to San Francisco to start work on this issue's cover story, a team of *Macworld* editors invaded my home and turned it into an ad hoc Silicon Valley bureau. With the aid of several wireless PowerBooks and iBooks, I had editors scattered through the house and even the backyard. A few hours later, we had the story finished—just making our deadline.

With fast access to the Internet and the ability to have multiple users anywhere in the house, my humble home network delivered the infrastructure needed by a whole workgroup on the spur of the moment. It made me appreciate just how far we've come. Anywhere, anytime computing is finally here, delivered not by huge corporations, but by homespun networks like the one that lives in my house. m

Questions? Comments? E-mail them to Andy at visionthing@macworld.com.

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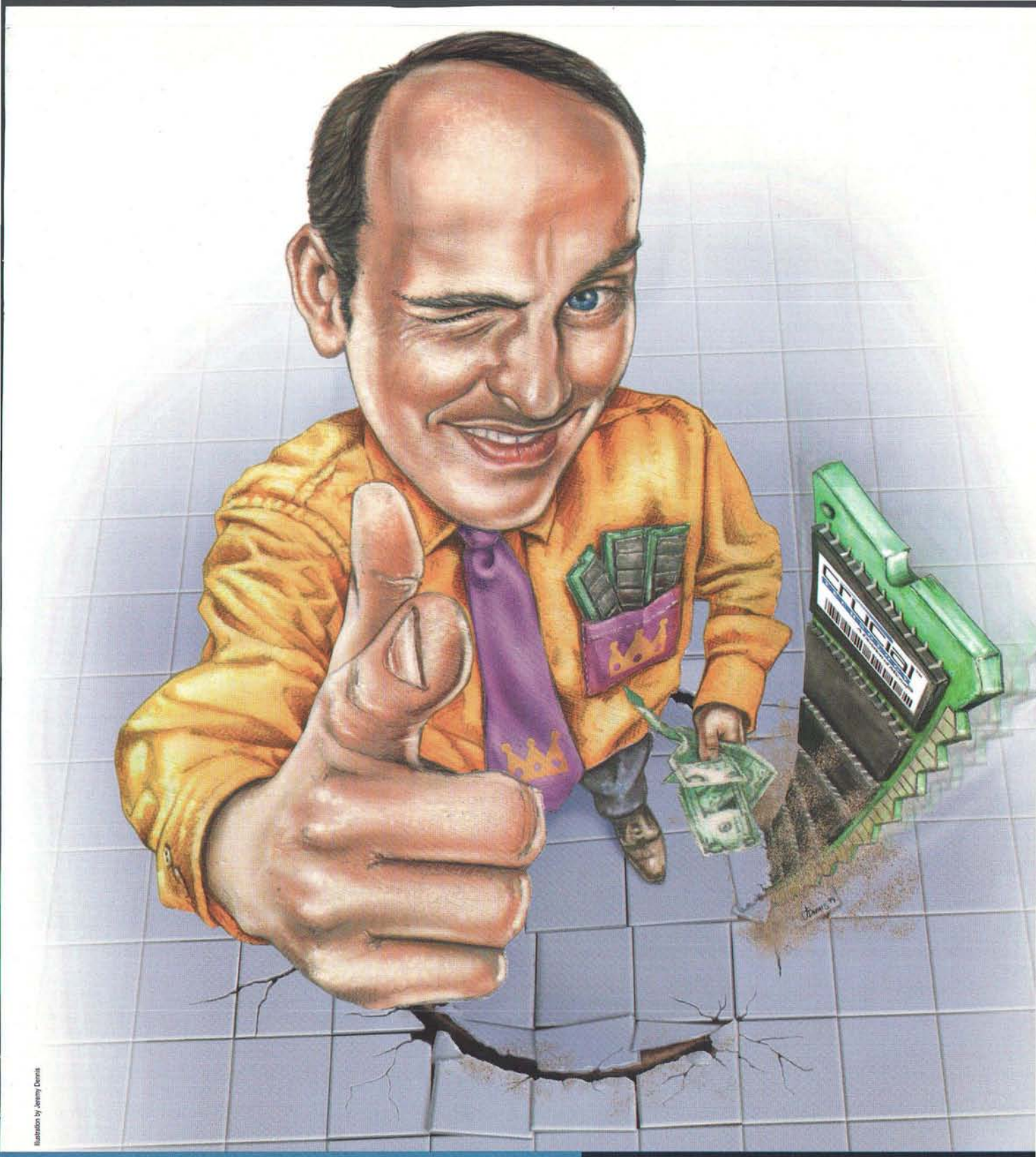

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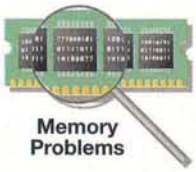

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News

online

Internet Firms Fight for Bite of Apple

AOL, EARTHLINK HAVE PLENTY IN STORE FOR MAC MARKET

by Philip Michaels

NICHOLAS WILTON

Get ready for a rumble. In this corner, with 21 million members and a new version of its Mac software, stands America Online, the world's largest Internet service provider. Its opponent, fresh from its merger with MindSpring and a new partnership with Apple, is EarthLink.

What's at stake? The hearts and minds—as well as the business—of Mac users, many of whom are new to the Net and looking for an ISP to call their own.

A Numbers Game Mac users make up a growing market for AOL and EarthLink to woo. Apple estimates that 93 percent of iMac buyers go online—62 percent are surfing the Web the first day they buy the computer. Those new users need ISPs—and in turn, those ISPs need to offer new users compelling reasons to pick them over rivals.

AOL and EarthLink have long histories with Apple. AOL (800/827-6364, www.aol.com) got its start a decade ago designing an online service for Mac users. When EarthLink (800/395-8425, www.earthlink.net) rolled out the first version of its software, the product came only in Mac form.

You've Got Upgrades Mac users make up about 10 percent of AOL's subscriber base. The ISP giant hopes to build on that with a software upgrade. The company expects to release AOL 5.0 for the Mac by early spring; it may already be available by the time you read this.

The upgrade adds many features already available in AOL's Windows version. My Calendar allows subscribers to track appointments and personal events. My Places lets users customize their Welcome page by adding links to their favorite AOL channels. With You've Got Pictures, AOL members can drop off film for developing at Eastman Kodak retailers and view the digital prints online. Other features allow users to retrieve deleted mail and switch between screen names.

AOL 5.0 also includes a few Mac-specific features. Mac users can view animated GIF files and play sounds embedded in e-mail from other Mac members. The point is to personalize the online experience for users, AOL spokeswoman Marta Grutka says.

One feature that won't appear in AOL 5.0 for the Mac is the Internet software included in the Windows version. A class action suit filed in February claims the Windows software alters existing files and settings, making it

continues

hard to use rival ISPs. AOL, which denies the allegations, says the Internet feature targets Windows users only.

Apple Allies AOL may have a new version of its software on the way—but EarthLink has Apple's seal of approval. In a deal struck earlier this year, EarthLink became the only ISP in the Internet setup software that comes with any Mac sold in the United States. Apple gets a cut from each Mac customer who signs up with EarthLink, as well as a $200 million stake in the company.

With Apple's cash and immediate access to Mac buyers, EarthLink clearly benefits from the deal. But what's in it for Mac users? To lure new and existing Mac customers, EarthLink has offered a free month of service and a setup-fee waiver.

The ISP is also touting its customer support. Mac users make up about 15 percent to 20 percent of EarthLink's 3 million subscribers, and EarthLink in turn dedicates 20 percent of its tech-support resources to the Mac. (For the record, AOL says its Mac-specific support resources are proportional to the size of its Mac subscriber base.)

EarthLink plans to make its current services more Mac specific, CEO Garry Betty says. The ISP expects to update some of its applications to take advantage of the upcoming Mac OS X. It also may adapt its start page to reflect the look and feel of Apple's Aqua interface.

With a subscriber base that dwarfs EarthLink's, AOL isn't panicking over its rival's cozy relationship with Apple. But don't think the leading ISP isn't keeping a close eye on EarthLink and its moves in the Mac market.

"It really does push us to develop new features," AOL's Grutka says.

My Own Private Big-Screen TV

FREQUENT FLIERS WHO'VE STRAINED TO SEE TOO MANY in-flight movies can turn their weary eyes elsewhere for entertainment. The Eye-Trek FMD-150W from Olympus (800/622-6372, www.olympusamerica.com) may look like an ordinary pair of sunglasses, but these shades come with a 240,000-pixel personal TV display. Plug the Eye-Trek into a portable DVD player, and the effect is like watching a 62-inch screen from less than 7 feet away. The $899 gadget—$599 for a lower-resolution version—also hooks up to TVs, VCRs, camcorders, and laser disc players.—PHILIP MICHAELS

multimedia

Adobe Flashes Macromedia

LIVEMOTION MAY CHALLENGE WEB DESIGN TOOL

by Frith Breitzer

Macromedia (800/457-1774, www.macromedia.com) has spent the past few years virtually unchallenged as the maker of high-end multimedia Web design tools like Flash. But Flash's days as the only game in town may be coming to an end. Adobe (800/833-6687, www.adobe.com) will soon roll out a competitor called LiveMotion.

LiveMotion draws on one of Adobe's greatest strengths—years of experience developing interfaces for a wide variety of design tools, such as drawing, video-editing, and Web design programs. Adobe has leveraged that advantage throughout its product line by making programs work together seamlessly and standardizing interfaces.

LiveMotion features an interface almost identical to that of ImageStyler, a Web-graphics tool discontinued by Adobe. As with ImageStyler, LiveMotion lets you drag objects—including EPS graphics and Adobe Photoshop documents—onto a canvas where you can apply the program's preset styles to them or create new styles using palette tools. Designers can add bevels, drop shadows, and other effects with one click.

What's more, users can apply any number of effects to one object and then instantly apply those effects to others by linking them. At any point, users can simultaneously edit the style on all linked objects.

LiveMotion's animation features owe a debt to another Adobe product: After Effects. With LiveMotion, you can animate object attributes via an After Effects–inspired timeline window. Flash relies on a more complex Macromedia Director–style animation interface, which can be challenging for designers to learn.

LiveMotion can read native Adobe Illustrator and Photoshop files. Photoshop compatibility is an expected advantage over Flash because Photoshop is the de facto standard in bitmap-editing programs.

Once users import a layered Photoshop file into LiveMotion, they can treat the file as a single-image object or explode its layers into separate objects to be manipulated individually. Users can also bring objects created in LiveMotion into Illustrator or Photoshop for editing; the object is automatically updated in LiveMotion. Since LiveMotion doesn't actually throw away any picture data, users can make last-minute changes.

LiveMotion can export files as JPEGs, animated GIFs, SVG animations, and Flash files. In addition, users can export objects within a LiveMotion document as different file types with different compression schemes controlled on a per-object basis. LiveMotion takes those files and automatically places them inside HTML tables.

LiveMotion is expected to ship in May. It will sell for $399, though Adobe will offer it to registered users of other Adobe products for $299 within the first 90 days of shipping.

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publishing

More Megapixels for Your Buck

HIGH-RES DIGITAL CAMERAS ON THE WAY

by Frith Breitzer

Maybe you were just getting used to the idea of 2-megapixel cameras—but digital camera makers aren't standing still. They're planning a slew of releases for the latest in high-resolution devices: cameras with resolutions topping 3 megapixels.

While the new models will cost approximately $1,000, they should drive down the prices of their 2-megapixel predecessors.

Nikon (800/526-4566, www.nikonusa.com) has announced the Coolpix 990, a 3.34-megapixel camera with a 3× optical zoom lens. The camera can generate nearly 10MB files with 2,048-by-1,536-pixel resolution.

Olympus C-3030 Zoom

SUZANNE ROADY

Quick Trigger The company claims the camera can shoot 2 frames per second (fps) in full resolution, nearly eliminating the lag time between shots in most digital cameras. In movie mode, the camera can shoot 40 seconds of 320-by-240-pixel resolution images at 15 fps. The Coolpix 990 accepts CompactFlash memory cards and has a USB interface. Its predecessor, the Coolpix 950, now sells for $900. Nikon plans an April 2000 release for the new camera.

Olympus (800/622-6372, www.olympus.com) has also announced a 3.34-megapixel camera. The C-3030 Zoom features a 3× optical zoom and USB and serial connectivity.

The camera features a 15-fps QuickTime movie mode that records 191 seconds of video at 160-by-120-pixel resolution or 46 seconds at 320 by 240 pixels. The C-3030 comes with a 16MB SmartMedia card and should ship this May.

Toshiba (800/288-1354, www.toshiba.com) planned to start shipping the PDR-M70 this March. The 3.37-megapixel CCD camera can produce 2,048-by-1,536-pixel images. The camera also has a 3× optical zoom and an AVI movie function capable of recording 30 seconds of 15-fps video at 320 by 240 pixels. It is USB-compatible and accepts SmartMedia cards.

Known mostly for its conventional film technologies, Fujifilm (800/800-3854, www.fujifilm.com) has recently announced the FinePix 4700 Zoom, a camera featuring the firm's Super CCD image sensor technology.

Diode Design The CCD has about 2.4 million photosites—light-sensitive diodes that record image information. Fujifilm says that the camera can produce a 4.3-megapixel image file, thanks to its Super CCD technology. Instead of placing rectangular photosites on a rectangular grid, Fujifilm arranges hexagonal diodes in a honeycomb pattern. By maximizing space, the company can boost the size of the photosites.

Because the Super CCD photosites are closer together and larger, they can measure light more accurately than a conventional CCD with the same number of diodes.

The FinePix 4700 Zoom features an AVI video function, a 3× optical zoom, and three metering modes. The USB-compatible camera uses SmartMedia cards. It should ship in April 2000.

publishing

InDesign Update in Store

FEATURES ADDED TO IMPROVE WORKFLOW

by Frith Breitzer

Designers who balked at buying Adobe's InDesign 1.0 may have a new incentive to give the program a shot. The upcoming InDesign 1.5 boasts new features and improvements requested by customers. Adobe says the upgrade streamlines prepress and printing workflow.

InDesign 1.5 promises designers the ability to align text to any path and edit paths more easily. A new eyedropper tool allows users to instantly copy attributes, including text formats, between objects. The program features an improved interface for selecting and editing colors; new drawing tools; and a flexible free-transform tool for rotating

Product WATCH

Camera-Ready The **Palm Pilot** and the **Handspring Visor** will soon do more than track appointments and keep you organized. They'll help you take pictures, too, thanks to a pair of digital camera accessories. Ideo Product Development's (650/688-3400, www.eyemodule.com) **Eyemodule** digital camera snaps into the Handspring Visor's Springboard port, letting users capture 24-bit color images; users can beam those images to other Visors or Palm OS–based handhelds. The $149 Eyemodule will ship this spring. Palm III and Palm VII users will get a photo option of their own with Eastman Kodak's (800/235-6325, www.kodak.com) **PalmPix.** The 1.5-ounce device plugs into a Palm's HotSync port and functions as a 640-by-480-pixel resolution digital camera. The PalmPix should ship by early summer; it will sell for $179.

Color Me Palm Speaking of PDAs, Palm Computing (800/881-7256, www.palm.com) has added a splash of color with the late-February release of the **Palm IIIc.** The $499 handheld features an 8-bit color display designed to improve readability. It ships with four built-in applications, including an enhanced calculator and a digital photo album. And the rechargeable device runs on a new operating system, Palm OS 3.5.

The Sound and the Photos Samsung (201/902-0347, www.simplyamazing.com) wants to

continues

add a soundtrack to your next photo shoot. With the **Cybermax 35 MP3,** the company combines a digital camera and an MP3 player. The $290 device features 640-by-480-pixel resolution, a CompactFlash memory slot, and a USB interface. It will ship this spring.

Taking Care of E-business Document Express (858/551-6767, www.documentexpress.com) wants to eliminate some of the headaches for small companies doing business on the Web with its software for managing e-mail responses. **Document Express Pro 3.0** captures data from customer e-mail, generates and updates client databases, and produces personalized responses to customer queries. Available in April 2000, the new version adds some Web-page templates tied to Adobe GoLive and other templates geared toward Mac market retailers. Document Express Pro 3.0 will sell for around $150.

Hearing Aid Mac sound quality is expected to get a boost later this year when Plantronics (800/544-4660, www.plantronics.com) rolls out a line of four USB headsets. Boasting digital signal processing technology, the headsets offer improved clarity over analog models. They also include a microphone—good news for owners of the iBook, which has no audio input port. Plantronics hasn't yet set a price for the headsets, which will ship in the third quarter of 2000.—EDITED BY PHILIP MICHAELS

and scaling objects. On the production side, InDesign 1.5 offers PDF and printer export styles designed to ensure consistent print settings. And InDesign's expanded AppleScript support should allow users to automate more production processes, including choosing printer styles and creating PDF files.

Unlike QuarkXPress, which provides only low-resolution previews of graphics placed in documents, InDesign 1.5 has an optimized-resolution option. The feature allows users to choose whether specific graphics are shown at enhanced- or full-resolution mode.

InDesign 1.5 should be shipping by the time you read this. It will cost $699; Adobe will offer InDesign 1.0 users an aggressive upgrade price.

systems

G4s Go Back to the Future

POWER MACS GET LONG-ANTICIPATED SPEED BOOST

by Philip Michaels

Take a stab at this riddle: When is a new product upgrade not really all that new? Answer: When it was first announced several months before its release. Apple (800/795-1000, www.apple.com) has boosted the processor speeds on its Power Mac G4 product line, with the fastest G4 now clocking in at 500MHz. The G4 systems also come in 400MHz and 450MHz versions.

Don't be alarmed if that news feels like déjà vu. Apple first announced these souped-up desktops in fall 1999.

Why the delay? Chip supplier Motorola couldn't deliver enough 500MHz G4 processors. A chagrined Apple had to reconfigure its G4 line with lower-speed chips but sold the slower machines at the same prices it had set for the faster models. Adding to Apple's public-relations woes, the company gave conflicting information on which G4 orders would be honored.

With IBM soon joining Motorola in supplying processors, Apple has enough of them on hand to release the 500MHz G4s. Apple will sell the faster machines at the prices it announced last fall: $3,499 for the 500MHz G4, $2,499 for the 450MHz model, and $1,599 for the 400MHz version.

The G4 comes with a subprocessor, dubbed Velocity Engine, that processes data with an expanded instruction set. As a result, a G4 processor can render graphics, encode sound, and perform calculations faster than a G3 can.

The catch? Developers have to modify their applications to take advantage of Velocity Engine features. Adobe has released Velocity Engine plug-ins for Photoshop 5.5 and After Effects 4.1, and other Macintosh developers have followed suit with new versions of software. Velocity Engine–friendly products include Casady & Greene's Sound-Jam MP, Terran Interactive's Media Cleaner Pro, Linker's Animation Stand 4.1, Heuris's MPEG Power Professional, Play's Amorphium, and Sonic Solutions' DVD Fusion.

Copyholder Gets High-Tech Look

PRINTERS, KEYBOARDS, AND MICE NOW SPORT THE iMac's translucent, fruit-flavored look. Why shouldn't low-tech products like copyholders follow suit? That's the idea behind Comfort Lab's (310/306-8434, www.comfortpoint.com) Page Up—a $6.95 page holder that comes in the five iMac colors. But Page Up's beauty is more than skin-deep. The portable plastic ball holds up to 15 pages at a 78-degree angle to keep them from wilting as you type. Page Up also boasts a compact design, freeing up desk space for other iMac-colored gadgets.—PHILIP MICHAELS

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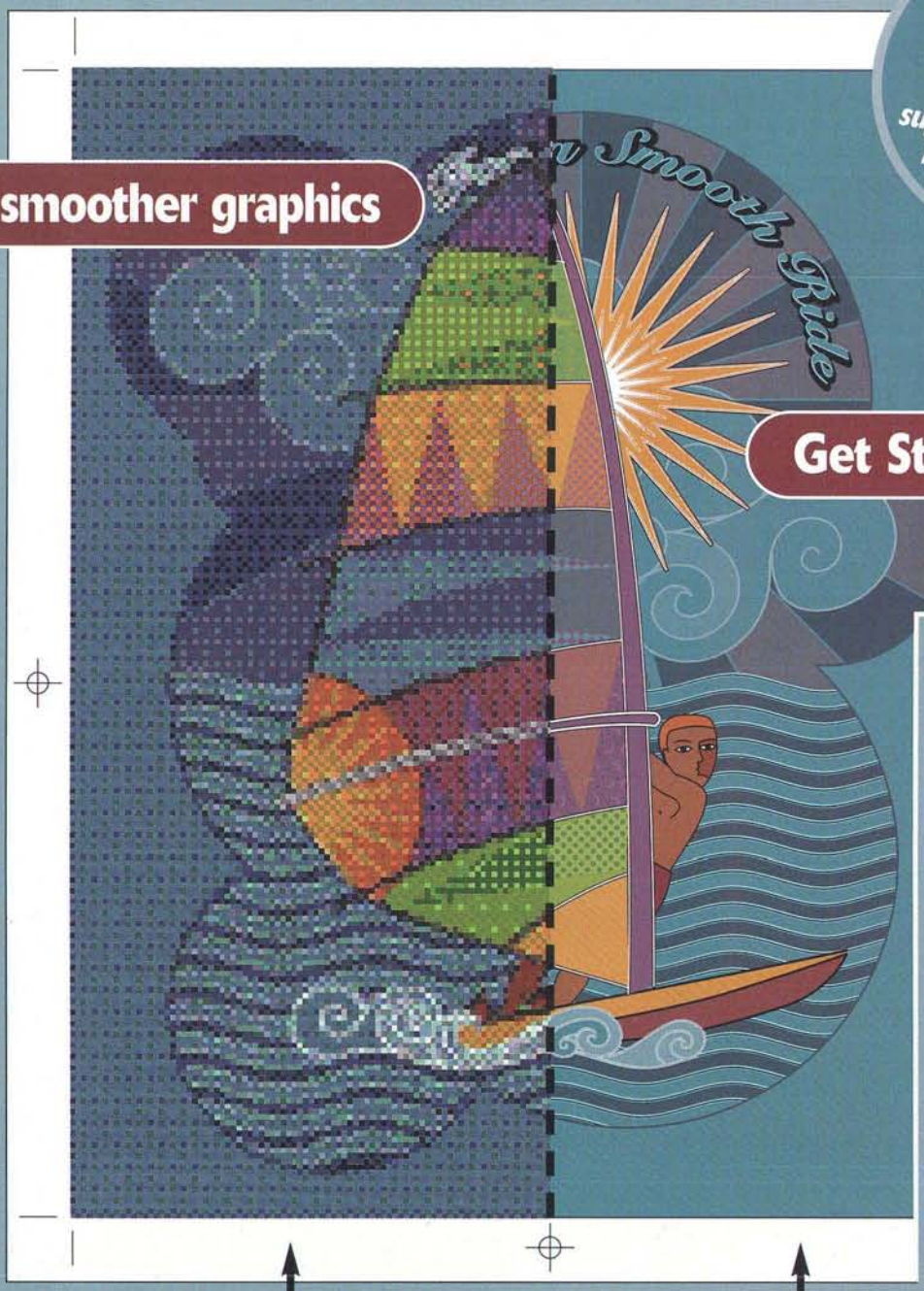

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Reviews

Lightweight Projectors

PRICEY LCD AND DLP PROJECTORS WEIGH LESS, LOOK GOOD

SUZANNE ROADY

LUGGING AROUND A HEAVY PROjector for a mobile presentation is nobody's idea of fun. Is a lightweight projector a better option? Macworld Lab looked at seven projectors, each weighing under 10 pounds, and we were pleasantly surprised. All of the projectors offer either outstanding or acceptable image contrast, color, and brightness (see "Battle of the Lightweights" for subjective test results). Unfortunately, although the projectors are small in size, they're not small in price: they start at $4,999 and climb from there. And it's important to remember that you're paying for weight (or lack of it); these projectors' features can't match those of heavier models.

The Quantity of Quality

Our jury of experts ran the projectors—four LCD models (the Proxima UltraLight LS1 and the Epson PowerLite 500c, 710c, and 5550c) and three DLP (digital light processing) models (the InFocus LP330, the NEC MultiSync LT84, and the Sharp Notevision7)—through subjective tests to evaluate brightness, contrast, color, gray-scale output, text rendering, and DVD video display. In tests of brightness, contrast, and color, none of the projectors performed unacceptably; however, the Epson PowerLite 710c and 5550c were the brightest and most pleasing to look at. Similarly, in our gray-scale tests, all the projectors achieved either excellent or fair results; the Epson PowerLite 710c and 5550c and the NEC MultiSync LT84 were the best of the bunch. The InFocus LP330 produced a fair gray-scale image but displayed "dancing" pixels that didn't go away when we adjusted the display.

For our text test, we used a simple PowerPoint presentation. With the exception of the InFocus LP330, the DLP projectors presented even 8-point fonts clearly—something the LCD projectors couldn't do, although they could accurately display fonts as small as 16-point before text began looking jagged and unreadable. The Proxima LS1 took some adjusting, but eventually it was able to project excellent-looking results.

We tested the projectors' DVD video abilities using a set-top DVD player similar to what you'd see in a simple home-theater setup. We connected the player to the projectors using an S-Video cable, an option available on all the models. The DLP projectors performed adequately when projecting DVD video but suffered from graininess and poor image quality. The LCD projectors did better, with the Epson PowerLite 500c and 710c ranking highest.

Set It and Forget It

If you'll be connecting your projector to a variety of computers, it's important that

REAL PRODUCTS REAL RATINGS — Reviews you can trust: Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.
OUTSTANDING: ♦♦♦♦♦ VERY GOOD: ♦♦♦♦ GOOD: ♦♦♦ FLAWED: ♦♦ UNACCEPTABLE: ♦

Macworld LAB TEST

Battle of the Lightweights

	Brightness	Contrast	Color	Gray Scale	Text	DVD Video
Epson PowerLite 500c	Excellent	Excellent	Fair	Fair	Fair	Excellent
Epson PowerLite 5550c	Excellent	Excellent	Excellent	Excellent	Fair	Fair
Epson PowerLite 710c	Excellent	Excellent	Excellent	Excellent	Fair	Excellent
InFocus LP330	Excellent	Excellent	Fair	Fair	Fair	Fair
NEC MultiSync LT84	Excellent	Fair	Fair	Excellent	Excellent	Fair
Proxima UltraLight LS1	Excellent	Fair	Fair	Fair	Excellent	Fair
Sharp Notevision7	Fair	Fair	Fair	Fair	Excellent	Fair

Behind Our Tests Macworld Lab conducted subjective tests, determining quality to be excellent, fair, or poor. Each projector was rated according to how well it displayed our test images created in Adobe Photoshop and Microsoft PowerPoint. Subjective DVD video quality was gauged using an S-Video signal from a set-top DVD player.—**Macworld Lab testing supervised by Kevin Mitchell**

the equipment work with little effort and be easy to set up. All the projectors we tested, except the InFocus LP330, could be set up with little or no problem. The InFocus required resetting monitor resolutions, restarting the computer, and resyncing to get the picture to display correctly.

The Sharp Notevision7 is the best plug-and-play projector of the group. It not only offers worry-free setup but also displays helpful, accurate progress bars while it warms up and while it syncs with the computer after you change the resolution. The other projectors aren't nearly as helpful, displaying either a blank screen or a simple dialog box.

Remotes and Sound

All the projectors come with both onboard and remote controls. The Proxima UltraLight LS1, Sharp Notevision7, and NEC MultiSync have remotes that include laser pointers. We found that the laser pointer drew attention to the screen faster than a mouse pointer or other projector-generated on-screen pointers.

The remotes can also be used to control the mouse. We judged the NEC MultiSync's optional remote to be the best in this category; it features a multidirectional pad for mouse movement. All the projectors except the Proxima LS1 are controllable from more than 20 feet away, even with obstacles between the remote and the projector.

In a small, quiet room, these projectors can pump out the sound. The Epson PowerLite 5550c and 710c offer 3-D surround sound, while the InFocus and NEC projectors feature stereo sound (the others offer mono sound). The Epson PowerLite 5550c and the Proxima UltraLight LS1 had the best sound quality; the worst was the Sharp Notevision7.

Macworld's Buying Advice

Full-size projectors are less expensive and better equipped than any of the lightweight projectors we tested. But if your projector will be moved around, taken on the road, or used in conjunction with a laptop, the lower weight might be worth the higher price. If you can spend the money, go for the Epson PowerLite 710c. It packs the best performance into one of the lightest chassis and offers trouble-free setup. If money is a concern, consider the Epson 5550c: it's an excellent value, packing the widest array of features, ease of use, and quality into a low price. It's the ideal projector for a multiuser environment on a budget.—BRETT LARSON

Lightweight Projectors Compared

Company	Product	Mouse Rating	List Price	Contact	Lumens	Native Resolution	Maximum Resolution (in pixels)	Display Technology	Weight (in pounds)
Epson	PowerLite 500c	♦♦♦½	$5,999	800/463-7766 www.epson.com	800	SVGA	1280 × 1,024	LCD	5.8
	PowerLite 5550c	♦♦♦½	$5,999		850	SVGA	1,024 × 768	LCD	9.4
	PowerLite 710c	♦♦♦♦½	$7,999		1,000	XGA	1,600 × 1,200	LCD	5.8
InFocus	LP330	♦♦½	$6,999	503/685-8888 www.infocus.com	650	XGA	1,024 × 768	DLP	4.8
NEC	MultiSync LT84	♦♦♦♦	$5,495	800/632-4636 www.nectec.com	700	SVGA	1,152 × 870	DLP	5.5
Proxima	UltraLight LS1	♦♦♦½	$4,999	800/447-7692 www.proxima.com	700	SVGA	1,024 × 768	LCD	8.4
Sharp	Notevision7	♦♦♦½	$8,995	888/513-7427 www.sharplcd.com	800	XGA	1,280 × 1,024	DLP	6.3

USB Scanners

CANON, UMAX OFFER SIMPLE, SPEEDY SCANNING

HOW MUCH DIFFERENCE IS THERE between a $129 scanner and a $179 one? Does the extra $50 actually get you anything? When the scanners in question are the $129 CanoScan FB 630Ui, from Canon, and the $179 Astra MX3, from Umax, the answer is yes.

The two scanners have very similar specs: they scan at an optical resolution of 600 by 1,200 pixels per inch, capturing 36 bits per pixel internally, and they're clearly aimed at the SOHO market, offering easy image scanning, optical character recognition (OCR), and integration with at least some e-mail applications. Both scanners are also reasonably speedy, taking just over a minute to scan a 4-by-6-inch color print at 600 dpi, and we were pleasantly surprised by the image quality they produced. However, the Astra provides a more generous software bundle, more connectivity options, and a better scanning engine than the CanoScan.

Small Is Beautiful

The CanoScan is tiny—10.1 by 14.6 by 1.5 inches—and weighs only 3.3 pounds. It draws power through the USB bus, so no AC adapter is necessary. The downside is that you must attach the scanner to a USB port capable of supplying enough power (2.5w at 500mA). If you have several USB devices attached to your Mac, you may run into trouble.

The Astra is a more conventional CCD scanner. It offers a SCSI-2 interface in addition to USB and draws power through an AC adapter. At 18.4 by 12.2 by 3.9 inches and 8.5 pounds, it's larger and much heavier than the CanoScan. Unlike Canon's scanner, it offers an optional transparency adapter. While the CanoScan is limited to 24-bit output, the Astra can capture raw high-bit scans as 48-bit RGB files. Umax's proprietary bit-enhancement technology uses software magic to increase the raw bit depth to 42 bits, producing significantly better shadow detail and smoother gradations.

The Astra has three buttons (compared with the CanoScan's one). You can configure these buttons as you wish: for example, one button to scan to a graphics application, one to copy an image straight to a printer, and one to scan to an e-mail or OCR program. However, you can't use these buttons to set cropping or adjust an image, so they aren't as useful as they might be.

Plugging In

Scanning is controlled through the CanoScan's plug-in driver, which contains a reasonably comprehensive set of tools for setting cropping, resolution, and color mode and adjusting tone and color balance. One option uses ColorSync to match the original on your monitor, but it can't scan to other profiles.

ARNOLD TIOSEJO

The CanoScan FB 630Ui (left) and Umax Astra MX3

In addition to its plug-in, the CanoScan's software bundle includes Canon Photo, CanoScan Toolbox, and Xerox's TextBridge Pro OCR. CanoScan Toolbox acts as command central for the scanner, letting you scan or fax a document or copy it directly to a printer. The program offers some basic postscan editing features, along with selection, drawing, and painting tools, but it's worth learning the plug-in's controls to optimize a scan *before* capturing it.

Canon Photo allows you to build collections of images, enhance individual images by using a wizardlike interface, and make electronic greeting cards that can contain audio annotations as well as images (any Mac user can read and hear the card, but cross-platform cards are limited to JPEG format with no audio). Rounding out the bundle is Xerox's TextBridge Pro, an OCR application that can "learn" to read poor-quality documents but requires considerable training time to produce recognizable text.

Umax bundles Presto PageManager; Presto PhotoAlbum; Caere OmniPage Limited Edition; Adobe PhotoDeluxe; and the VistaScan scanner driver, which can function as either a plug-in or a standalone application. VistaScan offers a few features that the CanoScan's plug-in lacks, including the ability to output a raw 42-bit RGB file, more-comprehensive image-editing controls, and presets for fax and OCR scanning.

PageManager allows you to catalog images and OCR-recognized text files and fax them or send them to your e-mail program at the press of a button. (The e-mail integration works only with Lotus cc:Mail, Microsoft Mail, CE Software's QuickMail, and Apple's PowerTalk.) Presto PhotoAlbum lets you save collections of photos as albums in a variety of templates with borders, sound annotation, and special effects. You can share albums by exporting them with the player application or as HTML documents.

OmniPage LE is an industrial-strength OCR application that lacks some of the bells and whistles offered by OmniPage Pro.

Macworld's Buying Advice

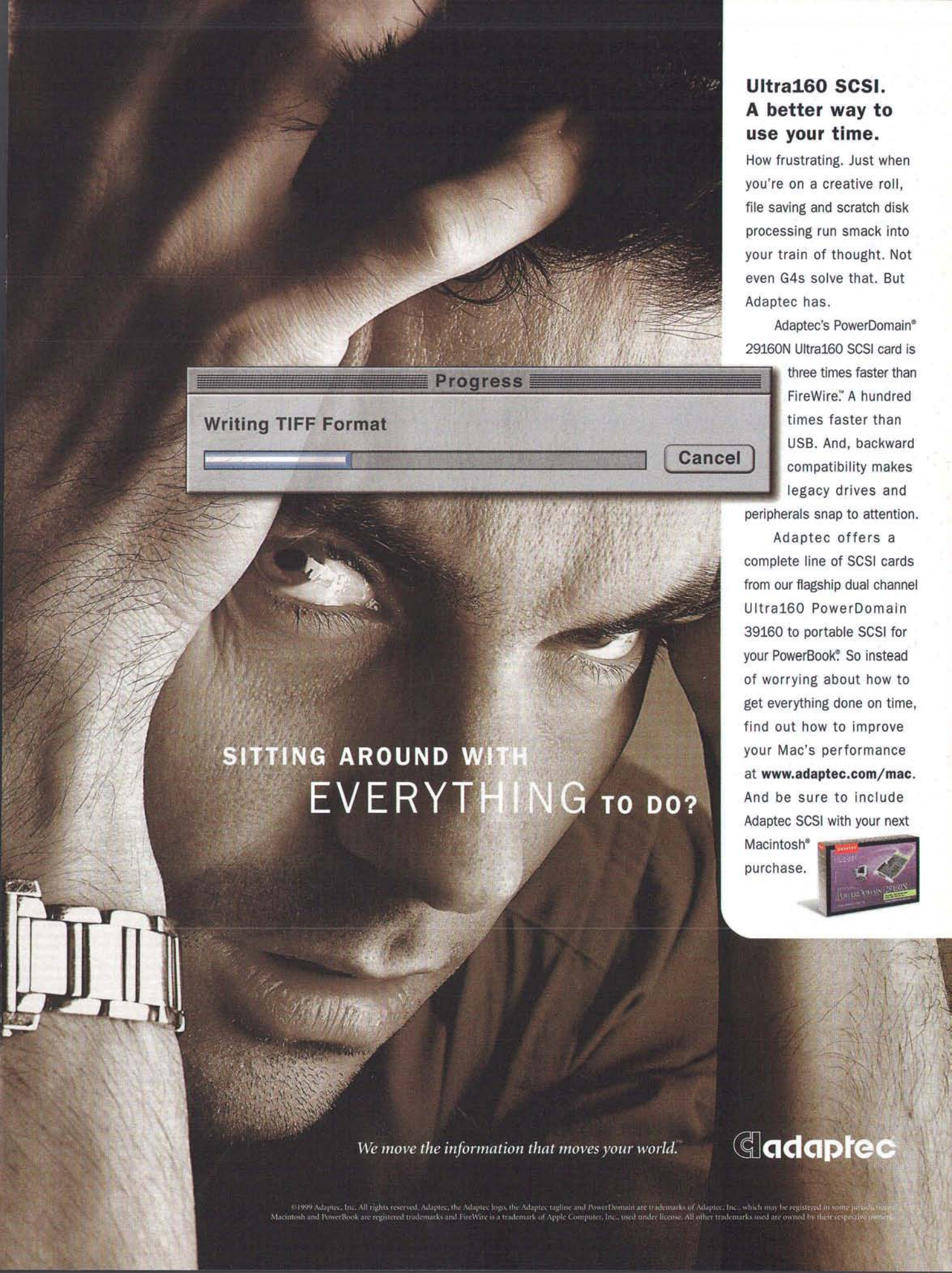
If you simply want a general-purpose scanner for creating Web images and doing OCR, either the Canon CanoScan FB 630Ui or the Umax Astra MX3 will fill the bill nicely. But if your main concern is scanning color images for hard-copy output, the Astra is almost certainly worth the extra money.—BRUCE FRASER

Astra MX3

RATING: ♦♦♦½ **PROS:** USB and SCSI-2 interfaces; good automation features; excellent image quality for the price. **CONS:** Limited e-mail integration. **COMPANY:** Umax Technologies (510/651-4000, www.umax.com). **COMPANY'S ESTIMATED PRICE:** $179.

CanoScan FB 630Ui

RATING: ♦♦♦ **PROS:** Tiny footprint; easy-to-use controls; good price. **CONS:** Limited connectivity options; basic image-editing features. **COMPANY:** Canon Computer Systems (800/652-2666, www.ccsi.canon.com). **COMPANY'S ESTIMATED PRICE:** $129.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SITTING AROUND WITH
EVERYTHING TO DO?
Ultra160 SCSI.
A better way to use your time.
How frustrating. Just when you're on a creative roll, file saving and scratch disk processing run smack into your train of thought. Not even G4s solve that. But Adaptec has.
Adaptec's PowerDomain® 29160N Ultra160 SCSI card is three times faster than FireWire.™ A hundred times faster than USB. And, backward compatibility makes legacy drives and peripherals snap to attention.
Adaptec offers a complete line of SCSI cards from our flagship dual channel Ultra160 PowerDomain 39160 to portable SCSI for your PowerBook.® So instead of worrying about how to get everything done on time, find out how to improve your Mac's performance at www.adaptec.com/mac. And be sure to include Adaptec SCSI with your next Macintosh® purchase.
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LiveStage Professional 2.0

POWERFUL BUT PRICEY QUICKTIME AUTHORING

YOU MIGHT THINK OF APPLE'S QuickTime as simply a way to watch movie trailers, listen to Internet radio stations, or explore 360-degree panoramic scenes. But QuickTime also lets you create movies with sophisticated interactivity—clickable hot spots that control playback or that branch to Web pages, for example. Much of QuickTime's potential has remained untapped due to a lack of capable authoring tools; the first offerings, Electrifier's Electrifier Pro and Totally Hip Software's LiveStage, showed promise but were burdened by awkward interfaces and feature limitations (see *Reviews*, May 1999).

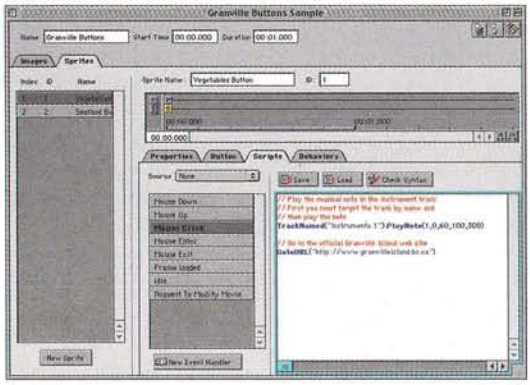
LiveStage Professional 2.0.1 is a big step forward. Gone are its predecessor's most glaring limitations, such as the inability to import existing QuickTime content. Totally Hip has also included a printed manual, which was conspicuously absent from earlier versions.

But LiveStage Professional remains more suited to programmers than to designers. Implementing interactivity usually means writing scripts, and the cumbersome interface lacks the polish of Macromedia Flash's authoring environment.

The Authoring Process

Creating a project in LiveStage Professional involves importing existing content and then creating tracks and sprites. These elements control the project's appearance and interactivity via settings and scripts. Along the way, you use the Stage window to position your project's elements. When you're done, you save the project as a cross-platform QuickTime movie that you can embed in a Web page or play in any QuickTime-savvy program. The Stage window is only slightly improved over that of earlier versions, unfortunately—new tools make aligning objects easy, but the lack of rulers hinders layout chores.

The program can import all the usual suspects—QuickTime movies, sound files, and static images—as well as completed Flash projects (SWF files). The ability to import Flash movies enables developers to create animations and navigation elements in Flash, bring them into LiveStage, and integrate them with QuickTime content or enhance them with scripts. You can't modify Flash content within LiveStage, but you can augment it by attaching scripts to specific frames or events, such as a button press.



On the LiveStage LiveStage Professional 2.0.1 relies heavily on scripting. This script is for a button that, when clicked on, plays a sound and branches to a Web page.

LiveStage Professional lets you animate an element by tweening: specify its starting and ending position, and LiveStage creates the intermediate values. You can tween everything from an object's position, to a QuickTime VR panorama's viewing angle, to an image's graphics mode. But animating an element is awkward; rather than simply drawing an animation path, as in Flash and Director, you must peck values into a dialog box and draw a path in a separate window.

Scripting, Debugging, Delivering

Creating an interactive item, such as a clickable button, usually means creating a sprite track in the Project window and then adding media and scripts to the track in a separate Sprite window. Although LiveStage Professional relies heavily on scripting, it does offer several keystroke-saving features. A palette gives you one-click access to all the keywords and constructs in LiveStage's programming language. Simply drag a keyword to the desired location within a script, and then type any required parameters.

Version 2.0 also features *behaviors*. These canned scripts handle common tasks, such as displaying a Web page when users click on a button. Drag a behavior into a Sprite window, type any required attributes, and you're done—no manual scripting necessary. Advanced scripters can create their own behaviors and add them to LiveStage Professional's Library or pass them along to colleagues.

Also new to version 2 is support for AppleScript. You can create scripts that automate repetitive tasks, such as specifying compression settings for a large collection of images. A handy Debugging window displays info as a project is running, though it would be more valuable if it displayed the contents of variables as scripts ran.

When you've finished a project, choose Export Wired Movie, and LiveStage Professional produces a stand-alone QuickTime movie ready for publishing—after you hand-code some HTML, that is (unlike Flash, LiveStage doesn't create the HTML necessary to display your movie).

Macworld's Buying Advice

LiveStage Professional 2.0.1 is by far the most versatile and powerful QuickTime-authoring program. Its only competition is Electrifier's Electrifier Pro, which is languishing as its publisher focuses on other ventures. But at $700, LiveStage Professional is overpriced, even when you consider that it includes Totally Hip's terrific WebPainter animation utility. And it needs more polish; its interface can be awkward, its Undo command works inconsistently, and the program occasionally crashed during testing.

Indisputably a powerful tool for adding advanced interactivity to QuickTime movies and for combining Flash and QuickTime content, LiveStage Professional also has a lot to offer QuickTime VR producers, who can use it to create interactive hot spots and add automatic panning and zooming features to VR panoramas. But the program is too expensive and too complex for all but the most dedicated QuickTime authors.—JIM HEID

RATING: ♦♦♦ **PROS:** Powerful scripting features; versatile. **CONS:** Can be cumbersome; flaky Undo command; occasional crashes; expensive. **COMPANY:** Totally Hip Software (604/685-6525, www.totallyhip.com). **LIST PRICE:** $700.

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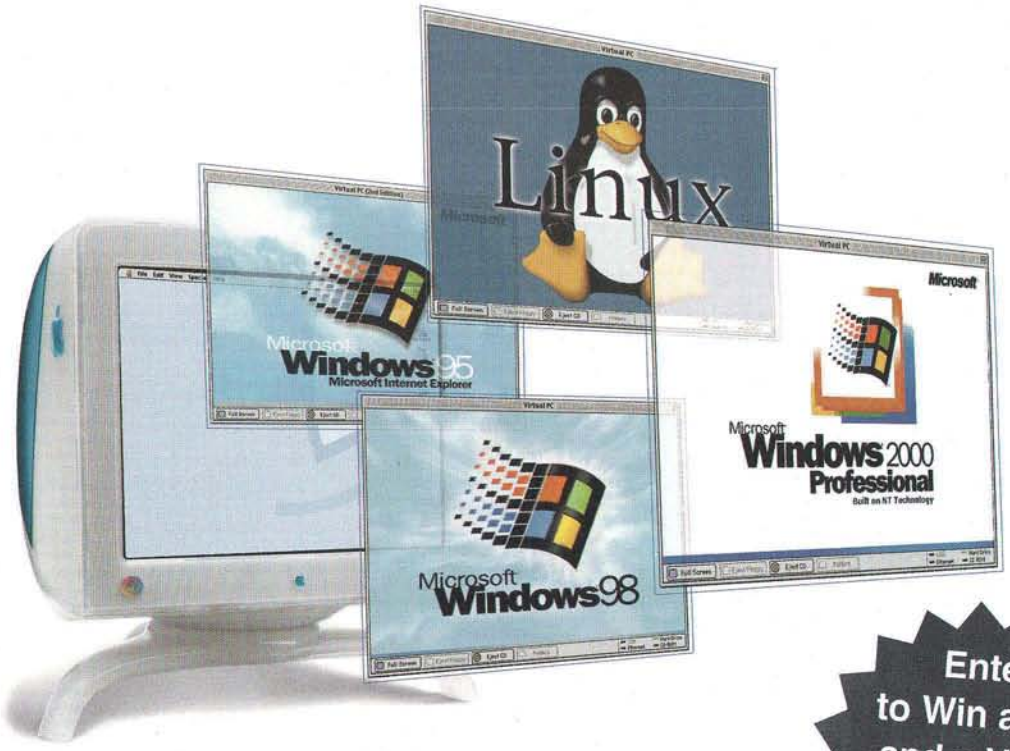

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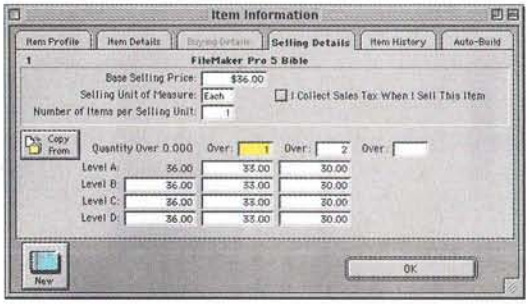
MYOB Accounting Plus 9.0

CONFUSING INTERFACE MARS CAPABLE BUSINESS PROGRAM

FOLLOWING THE TREND TOWARD consolidation, MYOB has melded features from its two flagship accounting programs into one general-purpose package that lets you do it all—payroll, inventory, job tracking, and time billing. On a superficial level, MYOB Accounting Plus 9.0 hasn't changed substantially from earlier versions; the interface may still have you reaching for the manual or calling tech support. But MYOB Accounting Plus is an extremely capable program that, once mastered, will serve small and medium-size businesses admirably.



Price Breaks With MYOB Accounting Plus 9.0, any item you sell can have multiple price points based on customer status or quantity purchased.

MYOB Accounting Plus 9.0 offers some of the features of MYOB Premier Accounting, as well as enhancements such as print-to-file versions of reports and forms that you can e-mail to customers and vendors; multilevel pricing options; TCP/IP network support; and the ability to flag items, accounts, jobs, vendors, and customers as inactive. Although the program employs a double-entry system, balancing entries are made for you behind the scenes. MYOB Accounting Plus lets you choose from and customize more than 100 charts of accounts, including one based on the ever popular IRS Schedule C. You choose functions, such as writing checks and preparing payroll, by clicking on buttons in the flowchart-style interface.

Paperless Accounting

Rather than printing a form or report for mailing, you can now print it to disk, using the included JFAX print driver and extension. The resulting graphic file (a Group III fax TIFF) can be sent to a customer or vendor as an e-mail attachment and viewed with MYOB Viewer, an included shareware program based on GraphicConverter. Only a few current graphics programs can open Group III TIFFs, so you'll have to send a copy of MYOB Viewer to each potential recipient. (Optionally, MYOB Viewer can convert the print files to normal TIFFs or PICTs that can be viewed in any graphics program.) As long as users of the Windows version of MYOB Accounting Plus have a MAPI-compliant e-mail program, they can e-mail reports and forms directly from the program. One caveat: whenever we launched an Internet program or attempted to shut down after using JFAX, a system crash ensued. According to MYOB, however, no one else has reported similar problems.

The new version is multiuser-ready; it can be used on a network (including a mixed Mac-and-PC one) right out of the box, though only one person at a time can access the data file. If you want to allow multiple users to access the data simultaneously, you can purchase additional workstation licenses. Version 9.0 also adds TCP/IP to the list of supported network protocols (NetBIOS, NetBEUI, LANBIOS, and AppleTalk).

Money Matters

You can now set as many as six pricing tiers for each item you sell (see "Price Breaks"), allowing you to establish preferred pricing for special customers, for example, or vary prices according to quantity purchased. You can apply pricing tiers in two ways. You can assign a tier to each customer—by default, the customer is charged that tier's price for every item purchased—or you can specify a default pricing tier for all the items you sell and have those prices applied automatically to all sales for which the customer doesn't have a specific tier assigned. This second approach has one drawback: there's no simple way to apply multiple tiers to a customer's purchases. When recording an invoice, for example, you can't choose Level A pricing from a pop-up list for one item and Level B for another; you have to manually edit the prices on the customer's invoice, either from memory or by consulting a price list.

If your company conducts business outside the United States, you'll be pleased to note that you can now record transactions in foreign currencies. All you have to do is specify that a vendor or customer's transactions are in euros, for example, and the program records all their sales and purchases in that currency. It's up to you to keep the exchange rates current by periodically editing the program's Currency List. MYOB Accounting Plus also includes an easy-to-use currency calculator.

Another new feature is the ability to enter interest and service charges in the Account Reconciliation screen. To reduce clutter in product, customer, and vendor lists, you can mark any entry as inactive, thereby preventing it from showing up in choice lists. Importing and exporting capabilities have been expanded to include time-billing data, inventory, and customer and vendor payment terms. Finally, the search function's new Advanced button lets you search by date range or amount range and within memo text.

Macworld's Buying Advice

Like previous versions, MYOB Accounting Plus 9.0 makes setting up and using some features confusing and unintuitive; several features and options are practically hidden. (For example, we created two pricing tiers for an item based on quantity purchased, and we then tried unsuccessfully to apply the pricing automatically to all customers who hadn't been assigned a tier. A call to technical support revealed that we had to set a preference to apply one tier to all items purchased by new customers.) Nevertheless, businesspeople will find that the multitude of features and capabilities in MYOB Accounting make the learning curve a worthwhile climb.—STEVE SCHWARTZ

RATING: ♦♦♦♦ **PROS:** Network-ready; TCP/IP support; multitiered pricing; supports foreign currencies; improved search function. **CONS:** Can be confusing to set up and use; has formidable learning curve. **COMPANY:** MYOB (800/322-6962, www.myob.com/us). **COMPANY'S ESTIMATED PRICE:** $200; $99 per additional workstation license.

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Lotus Notes Release 5

SERIOUS E-MAIL AND SCHEDULING FOR GROUPS

OFFICIALLY, THE TERM *GROUPware* applies to software that businesses can use to promote collaboration; in the real world, it tends to mean "e-mail plus scheduling." The name Lotus Notes was virtually synonymous with *groupware* a few years back, but the program wasn't available for the Macintosh. After several twists and turns following IBM's acquisition of Lotus, Notes landed on the Mac, first as a Release 4.6 and now as a Release 5 (R5) client. (The corresponding Domino server is still primarily a Unix and Windows product.) The Mac version does an excellent but idiosyncratic job of handling e-mail and scheduling; it even functions as a Web browser.

The Mac client is available in two slightly different versions. Notes for Collaboration is used on both remote servers in general and Domino R5–based servers, so it supports database features specific to Domino. Notes for Messaging offers many impressive collaboration functions (including group scheduling over the Web) but lacks Domino-specific functions.

Open for Business

The basic architecture of Notes was developed before the rise of the Internet and the appearance of Web browsers, so it's not derived from Mosaic, as other Web browsers are. But the original programmers had the luxury of really thinking through what works and what doesn't in the way of business e-mail and scheduling. Notes lets you combine all your e-mail sources in a single in-box, works with all Internet e-mail protocols, and implements more and better security features than Microsoft Outlook and Netscape Communicator. Notes' e-mail component also sports a cool "soft" Trash function, a lifesaving feature that lets you recover deleted mail during a specified calendar interval. When you install Notes, it reads your Microsoft Internet Explorer and Netscape Navigator bookmarks and makes them available through icons on Notes' Welcome page (which you can customize with news headlines, stock quotes, and other Web components).

The scheduling functions support networkwide time management for interactive group calendars; detailed task prioritization; alarms; and total integration with to-do lists, contact lists, and Web elements such as bookmarks, images, and links. If you talk to users, you'll hear lots of enthusiasm for and loyalty to the program's scheduling features; when compared with online scheduling software, Notes really stands out.

Compared with other products at this level of complexity, Notes offers nearly effortless installation (it takes about 15 minutes). The client installer simply asks what connections you have (Domino server, standard ISP, or other remote connection) and ferrets out all other pertinent e-mail and Web information on its own. Installing the Domino R5 server software is another matter. We tested it on a Windows NT 4.0 Intel-based workstation, and installation was a serious matter requiring attention to dozens of settings; your business will need someone with a solid systems-administration background to install and maintain the Domino server. And whereas the client manual is thorough but easy to read, the server manual is stronger stuff.

To the Letter Interface glitches notwithstanding, Lotus Notes Release 5 is the most powerful e-mail client available, with dozens of convenient options.

The Macintosh client is quite a bit slower than its Windows equivalent on comparable hardware. It also displays two of the problems characteristic of software ported to the Mac from Windows code. First are the "mystery hangs"—when you log off of your remote online connection, the system crashes about one time out of six. Second are the memory-management problems. If you click on the icon for Internet Explorer during a session, you can't recover the memory used simply by closing that window. To be fair, the problem of not recognizing free memory when a function is closed is probably Microsoft's fault, since it happens in Office as well. Still, if Lotus puts an Internet Explorer icon on Notes' Welcome page, it should make sure it works.

Also, strangely, the labels for items on the Welcome screen are sometimes missing letters, so that *Mail* appears as *ai* and *Calendar* appears as *Ca endar* (see "To the Letter"). Finally, one minor interface complaint stems from Notes' long pre-Web history: what Mac user would expect the icon you click on to get your e-mail to be labeled not Mail but Replicator?

The Competitive Landscape

Realistically, there are no alternatives to Notes in its class. There are other schedulers, but none provide comparable flexibility and cross-network viewability to all groups. And there are other e-mail systems, of course, but compared with Notes, they're awkward and short on features. If Microsoft keeps adding Notes-style features to Outlook, Notes' nearest competitor as far as e-mail is concerned, Outlook 6 might be competitive with Notes R4.6, but it won't catch up to Notes R5 anytime soon. When Office 2000 hits the Mac, you could do some VisualBasic programming to implement a few Notes-like group-scheduling features, but very few PC users have successfully implemented groupware in Office.

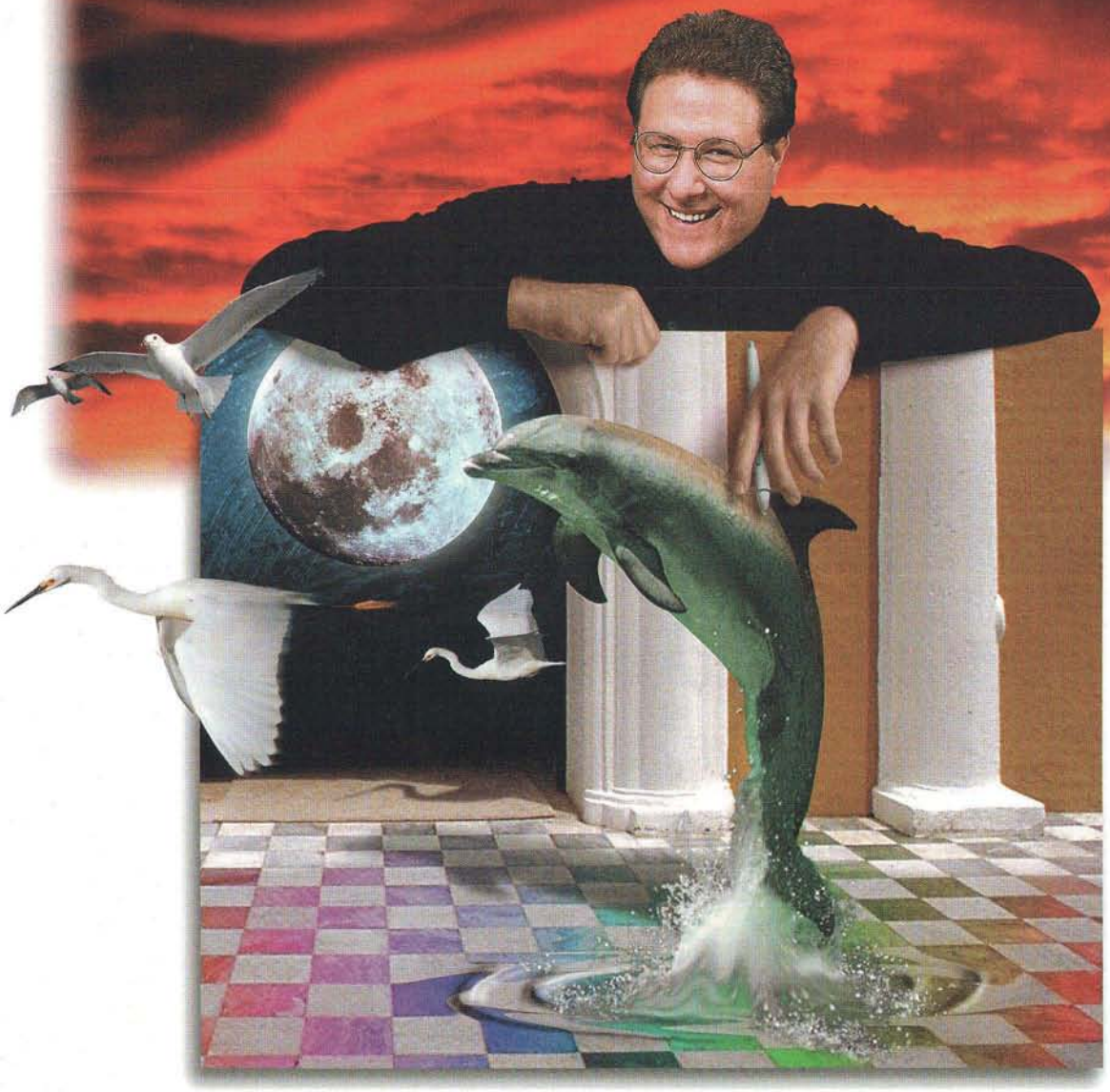
Macworld's Buying Advice

If you need to coordinate communication and activities across several groups or offices, Lotus Notes Release 5 is superior to all other products currently available. The only wrinkle for Mac users is that some of Notes' features require that an IT professional implement the $1,795 Domino server software on a non-Mac platform. For businesses large enough to have systems administrators, the power of Notes justifies the price.—CHARLES SEITER

RATING: ♦♦♦♦ **PROS:** Great options for handling e-mail; flexible group-scheduling features. **CONS:** Macintosh version needs platform-specific refinement. **COMPANY:** Lotus Development (800/343-5414, www.lotus.com). **LIST PRICE:** Notes for Messaging, $55; Notes for Collaboration, $69.

"There's only one essential tool in Photoshop..."

– Scott Kelby, Editor, Photoshop User Magazine



... and that's the Intuos graphic tablet system. The Intuos Pen takes Photoshop's eighteen pressure sensitive tools* to a new level, so you can clone with precision and control, create perfect layer masks, or simply feather one image into another with ease. The pen is ergonomic as well – which is great, because nothing's worse than having your hand cramp up when you're chasing a deadline late at night. And, even though I'm president of the National Association of Photoshop Professionals, occasionally I have to use a program other than Photoshop – and Intuos lets me do incredible things in other pressure sensitive programs such as Flash, Painter, CorelDraw and Illustrator as well.

To put it in a nutshell, this baby is sweet. If you're interested in making your Photoshop images fly off the page, grab onto one of these – and hold on for the ride."

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Details 3.0

SPECIALIZED PROJECT-MANAGEMENT DATABASE

TRADITIONAL PROJECT-MANAGEMENT software is useful for planning jobs and for letting you know whether you're falling behind schedule once a project has started. Unfortunately, these packages seldom track the fine points—submittals, change orders, and correspondence—crucial to a project's success. AEC Software's Details 3.0.1, a specialized database for small to medium-size graphic design, publishing, contracting, architecture, and manufacturing businesses, can help ensure that essential project information doesn't slip through the cracks.

Many professionals build FileMaker Pro databases or Microsoft Excel spreadsheets to record the specifics of their projects, but you're likely to find using Details 3.0 superior to creating your own databases or spreadsheets. First, the program's 70-plus specialized templates get you working quickly. These files contain preformatted fields, reports, and forms for project activities (expense reports, approvals, and phone logs, for example)—all you have to do is open a file and start entering your data. And several Details field types, such as Task Duration, aren't available in generic databases. As a result, Details' reports can include familiar project-management timeline graphs.

The new Forms function helps you modify existing forms or design new ones. Although forms are central to any good database, customizing Details' forms is especially easy. You can use intuitive drawing and properties palettes to drag and drop fields, place graphics, and make selections. This feature also lets you create electronic replicas of traditional paper forms and cut costs by printing documents on demand.

Time-savers

Usability features abound in Details 3.0. For instance, if you don't want to use a supplied template, you can build a new file quickly: you simply define your fields and then set up a report by selecting the fields you want to view. You don't face the daunting task of understanding relationships between fields, records, and index files and other typical complexities.

Nevertheless, Details 3.0 doesn't skimp on expected database functionality, such as storing preset values for fields and drop-down lists. The application goes beyond typical databases, by including three specialized field types—Contact, Project Log, and Submittal Log—for which the necessary subfields have already been defined.

More Than Functional Details 3.0.1's Forms Designer helps you create high-quality forms that contain just the information you need to collect.

Case in point: the Contact field contains address and phone-number placeholders. This thoughtful feature saves time when you're creating a database—and makes certain that users don't miss entering important facts, since related information is grouped in a single spot. And like a good project manager, Details offers a work calendar that accommodates shifts, weekends, holidays, and vacations. Consequently, the program accurately calculates the time needed to complete a job.

Professionals and support staff shouldn't have any trouble using Details 3.0. Data can be entered and edited either in forms or in the cells of a report. The displays are uncluttered, offering Navigation, Views, and Reports palettes that make it easy to shift among the screens.

Reporting Made Easy

Details' premade reports will be all most users need. For example, the Project Log format lets you store and report multiple tasks, dates, and durations for each record in your database. When used with the timeline graph, the Project Log is a powerful scheduling tool that works much like a standard project manager's outliner or Gantt bar chart.

If you do want to create or customize a Details report, simply choose the fields you want to see, specify their order, define the search criteria, and decide whether dates should appear as a graph. You can store unlimited report formats for each Details database.

Another helpful feature, Generator, constantly monitors the database. This means you don't have to run a report routine after new data is entered; all report listings are always up-to-date.

High-quality forms and reports can be printed or used in presentations. However, Details saves a report as one large image (in JPEG, TIFF, PNG, or PICT format), making e-mailing reports or posting them on a Web site somewhat inefficient. A better approach would be to save reports as HTML files. This could prove very useful, especially if the HTML file included hyperlinks from a task to supporting details. That said, those using Details can easily embed links that launch an e-mail program or a Web browser or open attached files.

Another area in need of improvement is Details' data import and export. Although the program can exchange information with other applications through ASCII text files, it would save novice users a lot of headaches if Details included file-import and -export compatibility with common project-management software, such as AEC's SureTrack or Microsoft Project.

Macworld's Buying Advice

Details 3.0.1 offers several benefits for professional managers. Little experience is needed for database setup, use, and reporting, and the program offers project-specific functions that aren't found in other database software. It would be helpful if Details could exchange data more easily with traditional project managers and had more-sophisticated Web-based reporting. Overall, though, Details 3.0 keeps you from making costly mistakes because of lost project information—without requiring a significant time or financial commitment.—MIKE HECK

RATING: ♦♦♦♦ **PROS:** Custom forms; easy report building; supports multiple users. **CONS:** Awkward integration with other applications. **COMPANY:** AEC Software (800/346-9413, www.aecsoft.com). **LIST PRICE:** $299.

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Rocket eBook Pro

NICE FEATURES BUT WEIGHTY DESIGN

WITH NEWSPAPERS, MAGAzines, and even greeting cards springing up online, print on paper seems to be headed the way of the dodo. NuvoMedia hopes its Rocket eBook Pro will do the same thing for books. This paperback-size handheld device stores electronic versions of books, offering avid readers an innovative way to haul around a modest library. But don't shed any tears for the printed word just yet—NuvoMedia needs to fix a weighty design flaw if the eBook is to gain wide acceptance.

The setup process is easy enough: you just insert the RocketLibrarian CD-ROM, click on the icon, and follow the instructions. The eBook's cradle hooks up easily to a serial port; iMac, G3, and G4 users will need a USB adapter.

Our unit came with two preloaded titles—*Alice's Adventures in Wonderland* and an electronic dictionary—along with an electronic user's guide. To store additional books on your eBook, you have to download them from NuvoMedia's Web site or from a retailer's site. Downloading is a snap: we were able to order an electronic copy of

GIBSON

The Adventures of Huckleberry Finn from www.barnesandnoble.com, download it, and store it on the eBook in about 10 minutes. You can store roughly 40 paperbacks on the eBook Pro. (The less expensive standard model, the $199 Rocket eBook, can store about 10 books.) You can delete titles from the eBook, though they remain stored on your Mac's hard drive.

The eBook includes some handy features, most notably a long battery life. NuvoMedia claims the battery will last up to 40 hours with the backlight feature turned off. We kept our eBook on for more than 2 hours and barely made a dent in the battery's power supply. Other nice features include the ability to add bookmarks, underline text, and write notes to yourself using a stylus and an interface reminiscent of a Palm Pilot's. The eBook even looks like an oversize PDA. But at 22 ounces, it's heavier than most handheld devices—certainly heftier than your typical paperback. Another design flaw is that the eBook is bottom-heavy, making it awkward to hold.

Other issues to keep in mind are cost and selection. Some electronic books sell for less than their print counterparts—as much as 60 percent less for older titles. Other electronic books cost *more* than their print counterparts. In any case, the $269 you'd spend on the eBook Pro could buy an armload of books. And at this point there are simply more books available in print than in electronic form; Barnes and Noble's Web site lists about 2,400 electronic titles.

Macworld's Buying Advice With its large storage capacity and long battery life, the Rocket eBook Pro is ideal for bibliophiles on the go. But casual consumers may find the steep price off-putting, and the eBook's heft may leave readers pining for old-fashioned paperbacks.—PHILIP MICHAELS

RATING: ♦♦♦½ **PROS:** Easy setup; downloading electronic books is a snap. **CONS:** Bulky and awkward; expensive. **COMPANY:** NuvoMedia (877/776-2538, www.rocket-ebook.com). **LIST PRICE:** $269.

Unreal Tournament

BEST NETWORK SHOOTER FOR THE MAC

THE FINAL RELEASE OF MACSOFT'S stellar Unreal Tournament lays to rest any concerns that *Macworld* acted precipitously in giving the then-unreleased shooter a place in the 1999 Macworld Game Hall of Fame (December 1999). Unreal Tournament is quite simply the best networkable 3-D shooter on the market today.

The key word here is *networkable*—although Unreal Tournament offers solo action, the single-player game is largely intended as training for network play. The game has almost no plot; your job is to kill or be killed. Your opponents in the single-player game are "bots," who—unlike the mechanized beasts found in earlier 3-D shooters—behave more like humans than like scripted robots. If you fire on an enemy, expect that enemy to dodge and duck while seeking the most efficient means of scattering your virtual giblets from one end of the game to the other.

Naturally, Unreal Tournament offers Deathmatch play, where it's you against the world, but it also supports cooperative play in Capture the Flag and in Domination—a

Comely Carnage With its beautiful environments and furious action, Unreal Tournament is a winner.

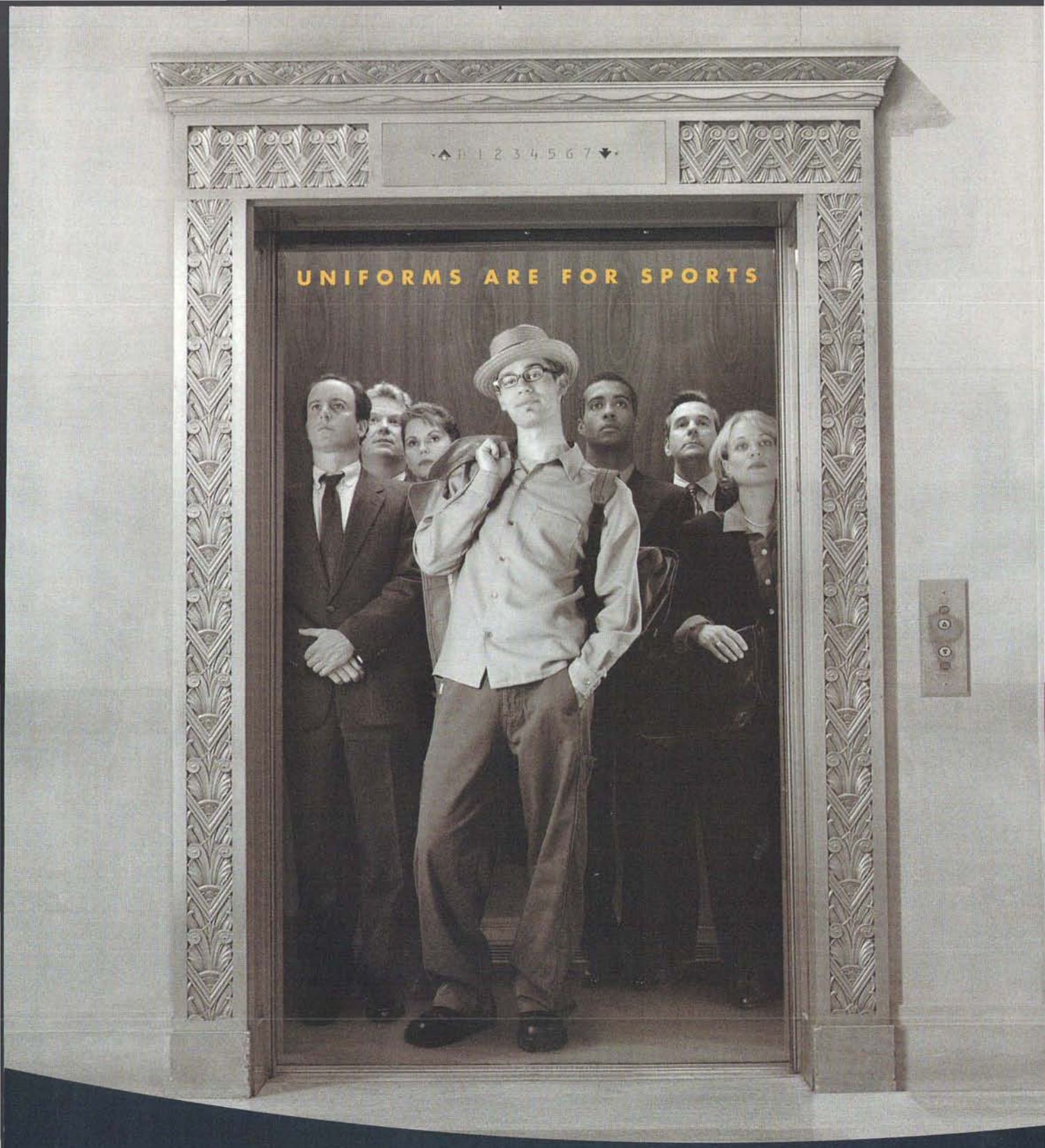
game where you and your team attempt to maintain control of checkpoints on a map. There's also Assault, where your team must defend or attack an installation.

This may sound like run-of-the-mill fare in a 3-D shooter, but what's extraordinary about Unreal Tournament is its level of refinement. If you've played the original Unreal, you can imagine how beautiful Tournament is. The game also boasts a wide variety of nicely balanced, intelligently designed maps. Special features include the ability to fly through a level before single-player battle begins, giving you an opportunity to case the joint before the firing starts; the option to be a spectator in team games; and the ability to configure the look as well as the behavior of individual bots—how alert they are, their favorite weapons, and their firing accuracy. You can even configure the game with special options called Mutators—these include low-gravity play; a mode in which all players are invisible; and Fatboy, which causes those players who perish routinely to get very skinny and those who have loads of kills to swell up, becoming easier targets.

Unreal Tournament isn't for everyone. Although you can turn down the gore and questionable language, the point of this game is to kill other virtual humans—male and female alike. If you oppose this sort of violence, steer clear. Also, if you don't have a G3 or G4 and robust 3-D–acceleration hardware, you'll be playing the game in a tiny window or with poor graphics.

Macworld's Buying Advice If the violence and hardware requirements don't unsettle you, you'll find Unreal Tournament nothing but unwholesome, bloody fun.—CHRISTOPHER BREEN

RATING: ♦♦♦♦½ **PROS:** Glorious graphics; varied game play. **CONS:** Hearty hardware requirements. **COMPANY:** MacSoft (800/229-2714, www.wizardworks.com/macsoft). **LIST PRICE:** $50.



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Palm-Compatible PIMs

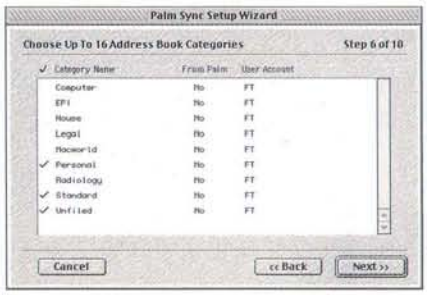
CONSULTANT SPLITS INTO PERSONAL ORGANIZER, GROUP ORGANIZER

CONSULTANT 2.5.3 WAS A RELIable PIM whose claim to fame was its synchronization with the Palm family of handheld organizers (see *Reviews*, April 1999.) Alas, limited alarms and other flaws detracted from an otherwise solid application. In response to requests for robust multiuser support, Chronos has split Consultant into two separate products: an updated version, Personal Organizer 3.0.1; and Group Organizer 3.0.1, a server-based program that lets users share contact and schedule information over a network.

Personal Organizer 3.0.1 sports a number of useful under-the-hood enhancements. For example, you no longer have to install a system extension to receive pop-up reminders; instead, a background application checks for alarms. Another program notifies you of the alarm and lets you dismiss or snooze it.

Unfortunately, Chronos hasn't remedied some of the deficiencies our last review mentioned. Notably, Personal Organizer still doesn't support timed to-do's: if you have to pick up the kids at exactly 4:30 p.m., for example, there's no simple way to put the task into your schedule. Personal Organizer's event-entry dialog box also makes you reach for your mouse far too often.

Despite a few start-up glitches, synchronization was fast and reliable on our system. However, Personal Organizer still insists on placing Palm to-do's on the current day rather than on the item's due date. Even if you have hundreds of completed tasks in your organizer, they all show up on the same day in your calendar.



In Sync Personal Organizer 3.0's Palm Sync setup wizard lets you choose which categories to synchronize.

Although Personal Organizer offers rudimentary multiuser support, only one person at a time has access to the data file. Group Organizer, in addition to providing all of Personal Organizer's functionality, uses a separate server application to let users simultaneously access contact and calendar data over an AppleTalk or TCP/IP network. However, we weren't able to set up our PowerBook G3 as a Group Organizer server without help from the company's technical-support staff, which responded promptly to our e-mailed inquiries.

One major drawback with the current implementation is that you must enable guest access and program linking on the remote computer, leaving the server vulnerable to tampering. We also found Personal Organizer's paradigm for controlling each user's file access a bit confusing.

Macworld's Buying Advice

It's gratifying that Chronos has continued to upgrade and support Personal Organizer, but Mac users looking for a stand-alone PIM can download 3Com's free MacPac 2.5. Personal Organizer also faces competition from the resurrected Now Contact/Up-to-Date bundle, which Power On Software has updated to work with Mac OS 9. (Palm synchronization should be available later this year.) Still, if you need a Palm-compatible PIM right now and MacPac's feature set isn't rich enough, Personal Organizer is a good choice. Until Chronos makes some vital changes to Group Organizer's data-sharing protocol, however, we can't recommend it as a multiuser PIM.—FRANKLIN TESSLER

Group Organizer 3.0.1

RATING: ♦♦½ **PROS:** No system extensions; improved alarms. **CONS:** Poor documentation; requires guest access to server. **COMPANY:** Chronos (801/957-1774, www.chronosnet.com). **LIST PRICE:** $100.

Personal Organizer 3.0.1

RATING: ♦♦♦½ **PROS:** No system extensions; improved alarms. **CONS:** No timed to-do's; Palm to-do's appear on current day. **COMPANY:** Chronos (801/957-1774, www.chronosnet.com). **LIST PRICE:** $60.

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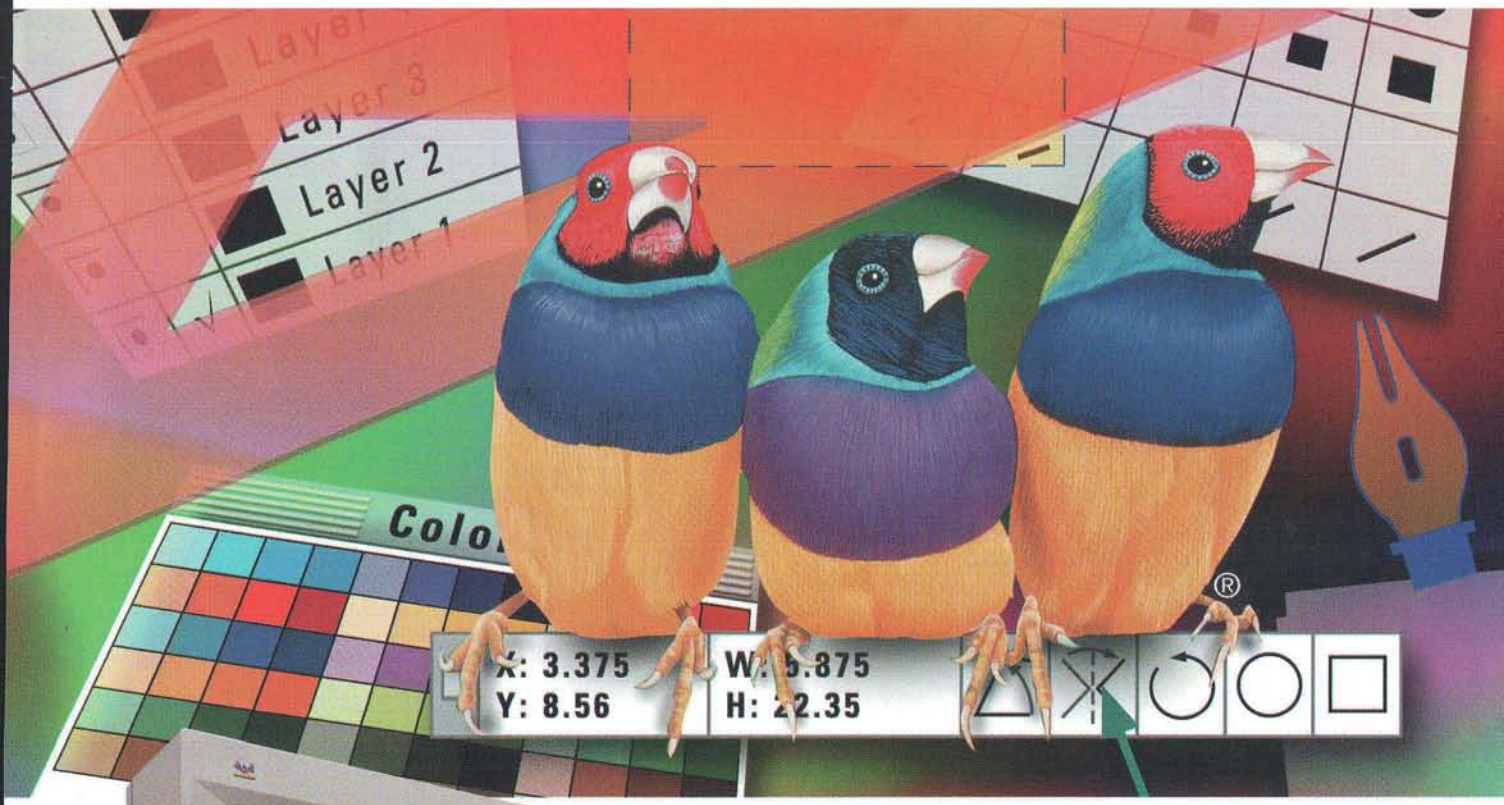

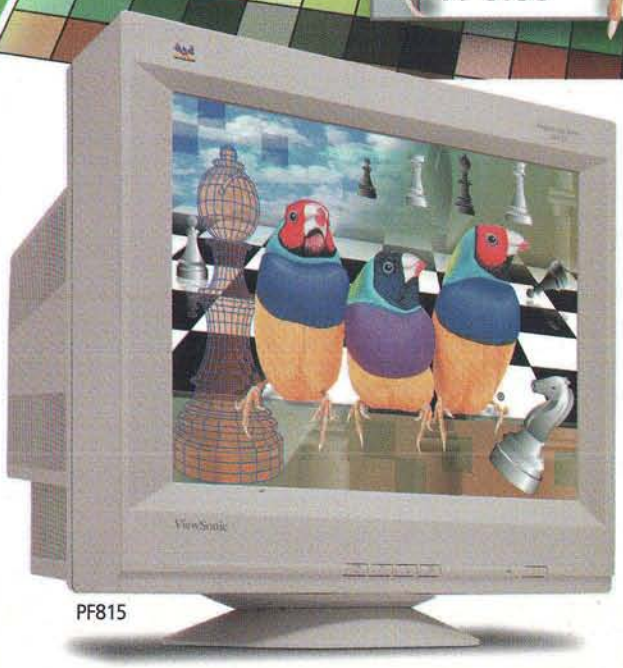

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Watch & Smile

NOTABLE FEATURES, LOUSY INTERFACE

GIVEN THE CURRENT GLUT OF digital cameras, software developers are rushing to market with inexpensive photo-editing programs for consumers. Binuscan, a company best known for high-end scanning software, has joined the fray with Watch & Smile 1.0, an inexpensive package that combines image-editing, digital video, and multimedia functions. The program packs some impressive features, including photo-retouching tools derived from the company's professional software. Unfortunately, Watch & Smile suffers from a poorly conceived interface that violates Macintosh software conventions in every way imaginable.

Mac Hostile Watch & Smile's poorly designed interface is about as un-Mac-like as it gets.

Watch & Smile is loosely based on a television metaphor. When you launch the program, a video of a TV monitor takes over the screen. You then click on that monitor's on/off button to enter the Watch & Smile workspace. At the top of the workspace is a scrollable horizontal filmstrip that can contain as many as 255 frames, which the program refers to as *scenes*. Each scene can contain multiple images, text, or videos; you can also record a soundtrack from an audio CD or the Mac's built-in microphone. When you complete a job, you can export the frames individually or as QuickTime movies complete with transitions.

Watch & Smile offers a huge array of photo-retouching features. You can adjust brightness, contrast, saturation, and sharpening using a paint tool or global slider controls; when modifying brightness, you can work on the entire image or within red, green, or blue color channels. The program also includes an autocorrection tool for enhancing low-quality images; a clone tool, similar to Adobe Photoshop's, for reproducing one part of an image in another; a pen tool for making clipping paths; and tools that let you add warping and perspective effects to your images.

Watch & Smile's multimedia features, while somewhat limited, offer nearly everything you need to create simple movies. You can move and copy scenes, set the display time for each frame, and choose from a variety of transition effects. You can test your movies using a VCR-like controller at the bottom of the screen.

Although Watch & Smile sports a hefty feature set, Mac users may find the proprietary interface, which relies heavily on cryptic icons, incredibly frustrating. Even fans of MetaCreations' wild-looking interface designs will likely find that this program goes too far in sacrificing function for style. It not only takes over your Mac, but also won't even let you switch to the Finder or another application without quitting the program. Forget about using any Mac-standard keyboard shortcuts: if you press ⌘-Z to undo an operation or ⌘-Q to quit, nothing happens. Exiting the program is an especially frustrating endeavor: you click on one on/off button, and then you end up in a separate screen with a different on/off control, which finally lets you quit. Adding insult to injury, the program lacks any rollover tool tips and provides few text labels to offer clues about each control's functions.

Macworld's Buying Advice

Considering its price, Watch & Smile offers an impressive array of photo-retouching and multimedia features. However, the poorly conceived interface will frustrate many users as they try to take advantage of those features. The most glaring omission is the inability to switch to other applications while using the program—it literally takes over your Mac until you quit. We also found performance sluggish, even on a 333MHz G3 system.—STEPHEN BEALE

RATING: ♦♦½ **PROS:** Affordable; extensive photo-retouching and multimedia features. **CONS:** Slow performance; poorly designed interface. **COMPANY:** Binuscan (212/681-0600, www.binuscan.com). **LIST PRICE:** $90.

DHCP Server 6.5

SIMPLE IP ADDRESS ADMINISTRATION

NOW THAT ALMOST ALL MACINtosh network services—including personal file sharing under OS 9—operate over TCP/IP, network administrators are discovering the travails of managing IP addresses in large networks. With TCP/IP, every user must have a unique IP address, subnet mask, gateway address, and DNS server address. You can administer about a dozen users manually, but beyond that number IP address management becomes a nightmare. Dynamic Host Configuration Protocol (DHCP) ends the bad dream by doling out IP address information to end users from a central server. Alas, while Macs can act as DHCP clients, no version of the OS has built-in DHCP server support.

Vicomsoft's DHCP Server 6.5 fills that gap, competing with commercial DHCP servers that run on Windows or Unix or as part of a dedicated network device. Vicomsoft's server boasts a low price and the ability to run on low-end Mac hardware (68040 processor, 8MB of RAM, and Mac OS 7.5.3 or higher). And unlike an embedded DHCP server, such as the one built into SonicWall's firewall, Vicomsoft's server doesn't forget all of its DHCP assignments when rebooted—a significant advantage on a large network with dozens or even hundreds of users.

Dynamic Delivery Vicomsoft's DHCP Server 6.5 automatically doles out IP addresses to users, even in complex networks with multiple IP subnets.

DHCP Server comes preconfigured to deliver 253 addresses in a standard private IP address range and subnet mask. You need only specify the IP address of your Internet gateway, a company domain name, and the addresses of as many as five DNS servers; DHCP Server then configures your clients—Mac, Windows, or

Unix—with these values. A Gateway extension lets you run other TCP/IP services, such as DNS, e-mail, and Web servers, on the same machine. An optional $29 remote-administration application enables you to configure and monitor DHCP Server from anywhere on your network.

Some machines, such as servers, require fixed IP assignments so users can locate them. DHCP Server has a workable, if ungraceful, provision for fixed addressing: you list these servers in a text file as IP-Ethernet address pairs. DHCP Server then uses the specified IP address instead of choosing one dynamically.

DHCP Server supports multiple Ethernet interfaces, letting you use a single server for more than one physical network. It also permits multiple IP address ranges on a single Ethernet interface—handy if you use IP addressing and a local router to separate user groups into different IP address ranges. DHCP Server can deliver as many as 1,024 IP addresses, so it can support even large networks.

DHCP Server does its job well but lacks two advanced features needed to make it a truly enterprise-class product: dynamic DNS and automatic fail-over. Dynamic DNS is a standard for maintaining domain-name associations with user IP addresses even when those addresses change. Without dynamic DNS, users must contact each other in advance to learn their IP addresses when they want to exchange files via personal file sharing. Automatic fail-over lets you run a backup DHCP server that maintains a copy of the DHCP database, so failure of the primary server won't cripple your network.

Macworld's Buying Advice

If you're running TCP/IP for a growing network, IP address administration is a nasty chore you can't ignore. If you have a network with several hundred users, Vicomsoft's DHCP Server 6.5 will simplify your life. Although DHCP Server lacks some advanced features, the advantage you gain by keeping this administrative function in the Macintosh fold makes it a good choice for basic DHCP.—MEL BECKMAN

RATING: ★★★½ **PROS:** Inexpensive; supports multiple address ranges and Ethernet cards; remote-administration option. **CONS:** Lacks dynamic DNS support; no automatic fail-over; awkward interface. **COMPANY:** Vicomsoft (800/818-4266, www.vicomsoft.com). **LIST PRICE:** $95.

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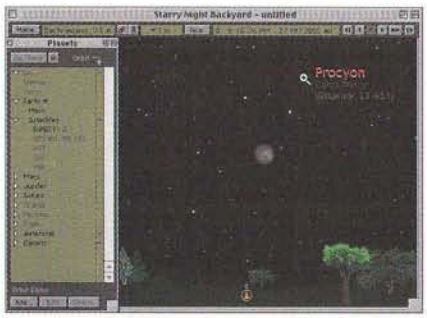
Starry Night

REALISTIC ASTRONOMY PROGRAM

DID YOU EVER WONDER WHAT the view would be like from Pluto? Want to fly into the Sun without getting flambéed? Now you can take a virtual trip to the heavens using Sienna Software's Starry Night Backyard and Starry Night Pro, a pair of programs that provide navigable star maps incorporating a wealth of astronomical information. The $64 Starry Night Backyard is aimed at beginning-to-intermediate stargazers; the $149 Starry Night Pro adds features for astronomers and serious hobbyists.

Both versions present a view of the night sky from any location you choose—including other planets. As you mouse over a celestial object, its name and distance from Earth appear next to it. Double-clicking on the object brings up a dialog box with extensive information about it, including distance, surface temperature, and luminosity. You can then click on the Go There button to launch an animated trip to that object. In addition to planets and stars, the star maps include constellations, comets, and orbiting satellites. If you want more information, the program accurately provides topic-specific links to NASA's Web site and to Livesky.com; the latter includes links to a variety of astronomy sites. In addition to searching for planets or satellites in the star map, you can also select them from a Planets palette.



To the Stars When you move your mouse over a star or planet, a label appears.

As you move through the heavens, you can print star charts and produce QuickTime movies of your animated journey. The Backyard version limits these movies to a 320-by-240-pixel selection; in the Pro version, you can select the entire sky view.

The Backyard version includes What's Happening Tonight, a link to Livesky.com that provides information about nightly celestial events, and Interesting Events, which takes you ahead or back in time to catch eclipses and planetary alignments.

Starry Night Pro adds features for advanced stargazers and incorporates a much wider array of celestial bodies, including comets, asteroids, and Messier objects—star clusters, nebulae, and galaxies originally plotted by 18th-century astronomer Charles Messier. A night-vision option, useful when you're using your computer with a telescope, adds a heavy red cast to your display, making it easier on your eyes when you look from the screen to the sky.

Macworld's Buying Advice Anyone with an interest in the skies above will find either version a rewarding educational experience. If you are a serious stargazer—or you want to create full-screen QuickTime movies—spend the extra money for the Pro version. However, the Backyard version also provides lots of quality stargazing for a more affordable price.—BRETT LARSON

RATING: ♦♦♦♦ **PROS:** Easy to use; thorough astronomical information; intelligent Internet links provide plenty of resources for more information. **CONS:** Limited QuickTime resolution in Backyard version; some Internet features lacking in Pro version. **COMPANY:** Sienna Software (416/410-0259, www.siennasoft.com). **COMPANY'S ESTIMATED PRICE:** Starry Night Backyard, $64; Starry Night Pro, $149.

Dazzle Digital Photo Maker

CAPTURE AND EDIT VIDEO AND STILLS ON THE CHEAP

UNLESS YOU'VE BEEN LIVING under a rock, you know that we're in the midst of a digital video revolution. If you're itching to be a revolutionary but don't want to spend $700 or more for a digital video camera, Dazzle Multimedia's Dazzle Digital Photo Maker will let you capture videos and stills through a tiny $100 device that connects your Mac's USB port to any video camera or VCR. The Dazzle's image quality and playback performance are ideal for users who want to edit and distribute movies over the Web or on CD-ROM, although the Mac version of the software leaves something to be desired.

The Dazzle hardware is a tiny, translucent, Bondi blue box with a single USB port on one side and three video connections on the other. You connect your video camera to the Dazzle hardware using an S-Video or composite RCA connector; a video pass-through connection lets you hook the device up to a TV or an NTSC monitor.

The software allows bare-bones capture and cuts-only editing. After specifying video settings, you can play a video from your camera using the software's preview window. Clicking on the Capture Photo button grabs a single frame and stores it as a still image. For simple video editing, you can set start and stop points and then drag selected video clips to a rudimentary timeline for sequencing.

Video Lite The Dazzle Digital Photo Maker lets you drag clips from a scrapbook onto a timeline.

To delete a clip from the timeline, unfortunately, you have to hold down the shift key while clicking on the clip to open a pop-up menu—a very Windows-like approach. You get little or no visual feedback while dragging clips around, and the Dazzle lacks an audio editor or facility for adding music beds or voice-overs.

A simple editing and retouching tool lets you correct and change still images. The Dazzle software is a competent editing environment, though the hardware's 320-by-240-pixel limitation for stills can prove frustrating. And rather than having to grab a still in real time, we'd prefer the ability to grab video and select a single frame to save.

Macworld's Buying Advice Although the software needs some improvements and streamlining, the Dazzle Digital Photo Maker is a very good tool for aspiring Web and CD producers. If you need to create simple videos and don't want to spring for a FireWire-equipped digital video camera, this is a great place to start.—BEN LONG

RATING: ♦♦♦½ **PROS:** Can digitize video from any source; simple hardware. **CONS:** Software doesn't allow additional audio tracks; un-Mac-like interface. **COMPANY:** Dazzle Multimedia (888/436-4348, www.dazzle.com). **LIST PRICE:** $100.

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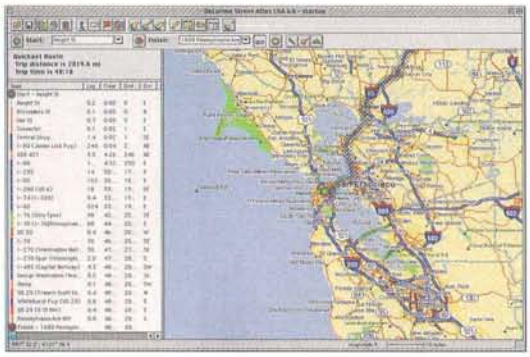
WHEN NOT EVEN MAPQUEST and MapBlast can get you where you're going, you may need a Global Positioning System (GPS) receiver. GPS devices determine your geographic location using signals transmitted by a ring of satellites orbiting Earth. One such receiver is DeLorme's Earthmate, a small, battery-powered box that attaches to your Mac's serial port. With its software, Street Atlas USA 6.0, the Earthmate can show you a full-color street map of your location and track you as you move. But although the software is quite impressive, the hardware is plagued with problems.



Find Your Way The Earthmate's Street Atlas USA 6.0 software lets you plan and customize your route.

Slightly larger than a deck of cards, the Earthmate receiver is a featureless yellow box sporting a standard serial cable. Setup involves nothing more than inserting four AAA batteries, attaching the unit to your Mac, and installing the software from a CD. To use the unit, you position it, launch Street Atlas, and tell the receiver to locate itself. Once the Earthmate knows where it is, your position is displayed as a green circle on a Street Atlas map. Tell the program to start tracking your movements, and the circle changes to a moving arrow that indicates your current position and bearing—at least in theory.

We found that the Earthmate could rarely hold its satellite lock for more than a few minutes, even with fresh batteries. The problem worsened when we drove among the tall buildings of San Francisco's Financial District. And since the unit needs to see as much sky as possible, you'll need to put it on the very front of your dashboard and find a way to keep it there. Even when the Earthmate *can* maintain its satellite lock, it can be off by as much as a city block.

The software is more impressive. In addition to detailed maps of the United States, Street Atlas provides trip-planning and -routing features. Pick two locations, and Street Atlas chooses a route between them. You can easily customize the route; for example, you can specify which types of roads you prefer to drive on. But unlike some GPS software, Street Atlas doesn't indicate when you've strayed from a planned route, nor can it use the Mac's speech facility to dictate driving directions. Sure, backseat drivers can be a drag, but trying to keep an eye on your PowerBook while driving is hardly practical.

Macworld's Buying Advice No matter how much trouble folding maps is, it's still easier than keeping the Earthmate working. Its Street Atlas USA 6.0 software shines, but the Earthmate's reliability problems make this a hard package to recommend. If you really need to find yourself, invest in a good road atlas.—BEN LONG

RATING: ♦♦½ **PROS:** Software is fast and well designed. **CONS:** Easily loses link with GPS satellites; tracking is not always accurate. **COMPANY:** DeLorme (800/452-5931, www.delorme.com). **COMPANY'S ESTIMATED PRICE:** $199.

Simply Postage

PRINT YOUR OWN STAMPS FROM A MAC

NOTHING MEASURES ONE'S commitment to the maxim "time is money" like paying for a service that's free but potentially time-consuming. For example, if you routinely make trips to the post office to purchase postage, you may find it more expedient to pay a surcharge for the convenience of printing postage from your Mac. You now have the opportunity to do just that with Neopost's Simply Postage 1.0.

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Printing postage is easy: just launch the Simply Postage application, click on the Create A Stamp button, enter the weight of the item you wish to mail, select the postage rate (domestic first-class letter or priority mail, for example), type the destination zip code, and click on the Print Now button. If you have the scale attached, you can click on the Get Item Weight From Scale option, and the program enters the weight and the price of postage. Within seconds, the printer rolls out a self-adhesive stamp about the size of a small shipping label. If you need a stamp with a value you've previously defined—33 cents, for example—you simply push a button on the printer. This works whether or not you have the Mac turned on.

ROBERT PERRY

Neopost makes no money from the hardware; you pay for the service and consumables. The company charges a monthly service fee of $9.95 (charged to your credit card or deducted from your bank account), $5 every time you purchase postage (the machine holds up to $500 worth), and $7 for a roll of 100 blank stamps (discounted if you purchase two or more rolls). A Purchase Postage button in the software logs you onto the Neopost server, downloads the desired postage to the printer, and debits your account. Federal regulations require the auditing of the printer every 90 days—a service provided via Neopost's Web site.

Our original test unit failed to work, but the follow-up one performed flawlessly. Our only complaints about Simply Postage are that the stamps are quite large and the printer isn't networkable—you can print stamps only from the Mac to which you attach it.

Macworld's Buying Advice The Simply Postage printer works as advertised, and the software is easy to use. If you're a SOHO user who can afford this kind of convenience, Simply Postage is simply marvelous.—CHRISTOPHER BREEN

RATING: ♦♦♦♦ **PROS:** Fast; easy to use. **CONS:** Not networkable; large stamps. **COMPANY:** Neopost (877/397-8267, www.simplypostage.com). **LIST PRICE:** $50, plus $9.95 per month and additional ongoing fees.

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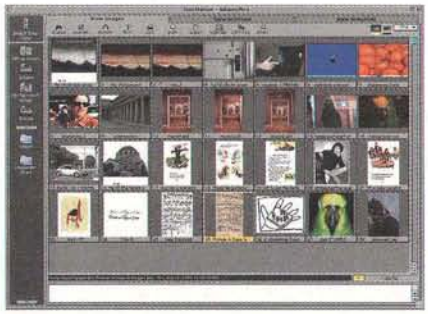
FotoStation 4.0

SIMPLE IMAGE CATALOGING

CHEAP SCANNERS AND DIGITAL cameras, not to mention a world of pictures on the Web, make it easy to amass a huge library of images. If a glut of images is swamping you, eRoket.com's FotoStation 4.0, an image-cataloging and -management application with a small footprint and speedy performance, may be worth a look. Unfortunately, the program's weak search function and rough interface might make you think twice.

FotoStation's interface consists of a large window for displaying images and a pane containing folders for organizing those images. Folders are either aliases or albums: clicking on an alias displays the contents of a folder as thumbnails, while albums are more like traditional catalogs that let you organize images by category. Although you can't access albums with a single click in the folder pane and you can't add to an album by dragging and dropping, it's a nice approach to media management.

You can either double-click on a thumbnail to view it at full-screen size or launch the image's creator application from a menu. You're also able to tag some images with standard IPTC (International Press Telecommunications Council) information, and you have access to tools for applying the same text to a number of images. Unfortunately, not all images can be tagged.



Clean Up Your Images FotoStation 4.0's thumbnail view lets you display a folder on your hard drive or a catalog of images stored in a FotoStation album.

Cataloging in FotoStation is fast. The program took only three seconds to catalog a folder of two dozen graphics files. Unfortunately, FotoStation catalogs everything in a folder—even files that aren't images. While you can define filters to exclude certain file types, it's a hassle. And although FotoStation recognizes QuickTime movies, it can't play them.

Interface problems plague FotoStation. Default buttons don't always work, and the menu display is sometimes buggy. One inexcusable feature: if you delete an image from an alias, FotoStation deletes that image from your hard drive with no warning.

If a database is only as useful as its search functions, FotoStation is in trouble. Its shockingly simple Find command lets you use only two criteria and one condition, either AND or OR. You can't search for a particular file type, you can't use wild-card characters, and the program's conditionals don't allow complex searches. Still, these limited searches are speedy.

FotoStation includes basic image-editing tools and can create slide shows and simple Web pages. These features are nice, but eRoket.com should concentrate on improving the cataloging tools.

Macworld's Buying Advice FotoStation 4.0's overall design works, but the program's rough interface and pathetic search tool make it frustrating to use. If your image-management needs don't include powerful searches, however, FotoStation might be a good tonic for your media glut.—BEN LONG

RATING: ♦♦♦ **PROS:** Speedy; small footprint. **CONS:** Rough interface; weak search function. **COMPANY:** eRoket.com (949/454-8469, www.eroket.com). **LIST PRICE:** $145.

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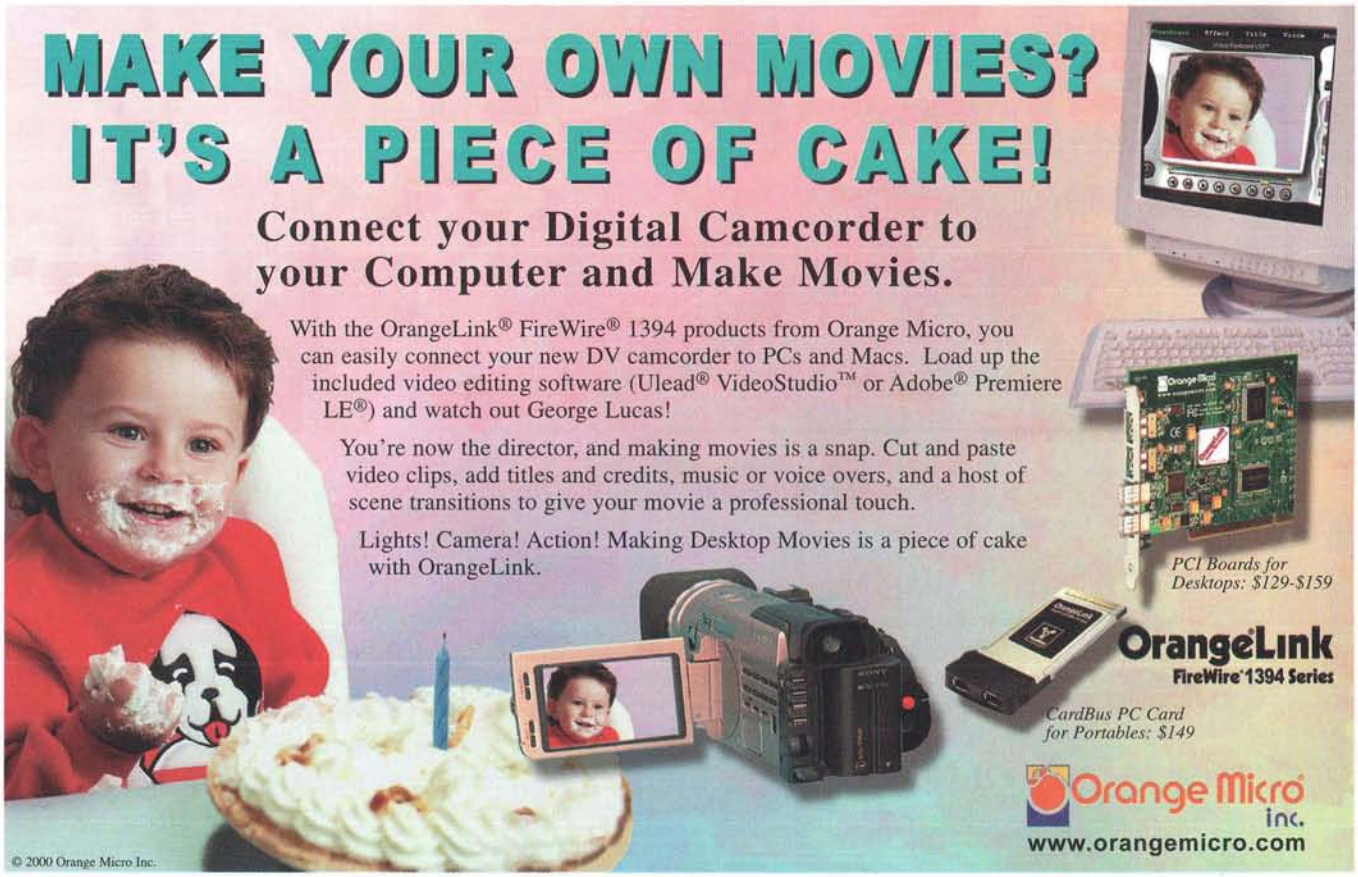

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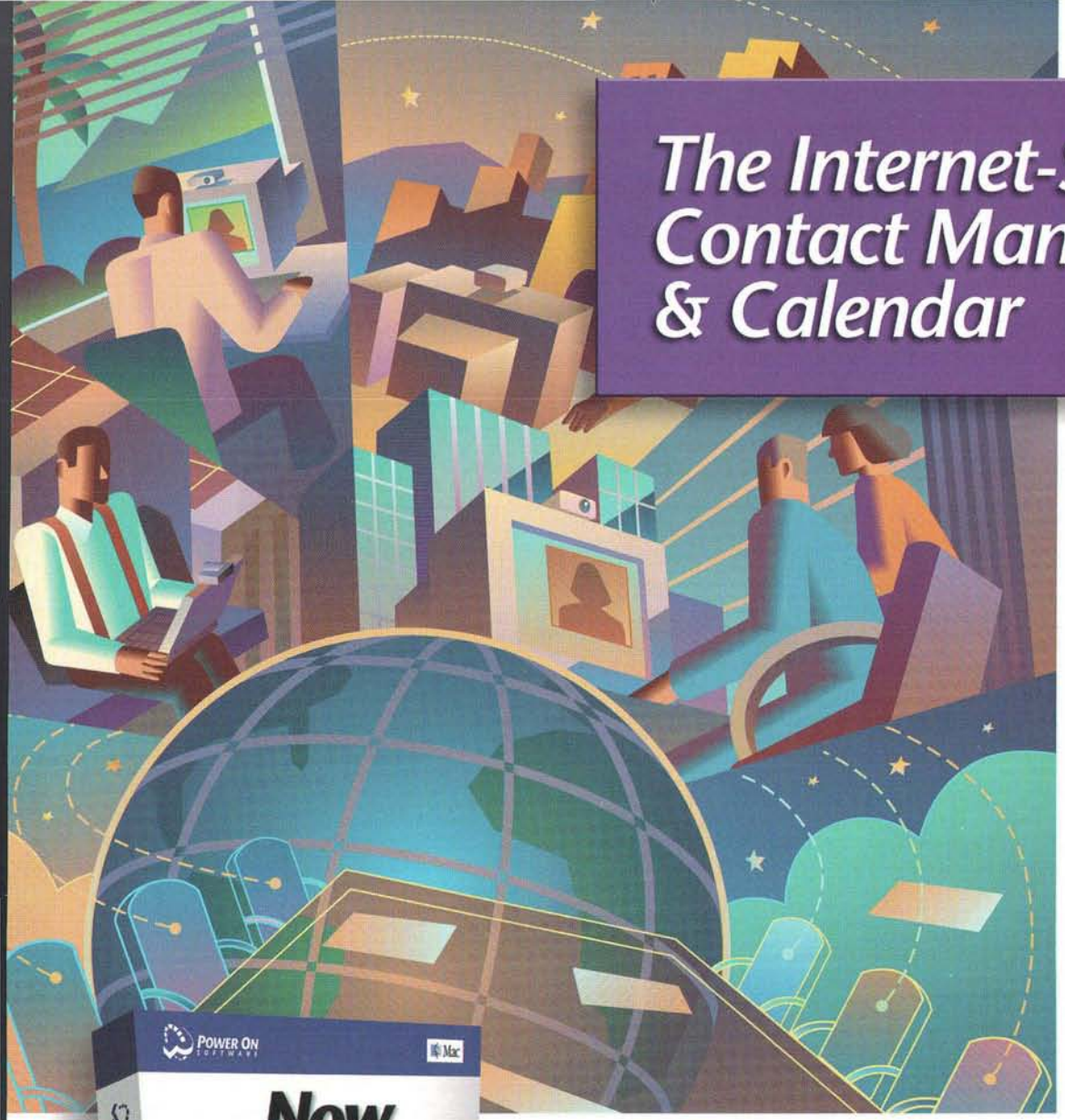

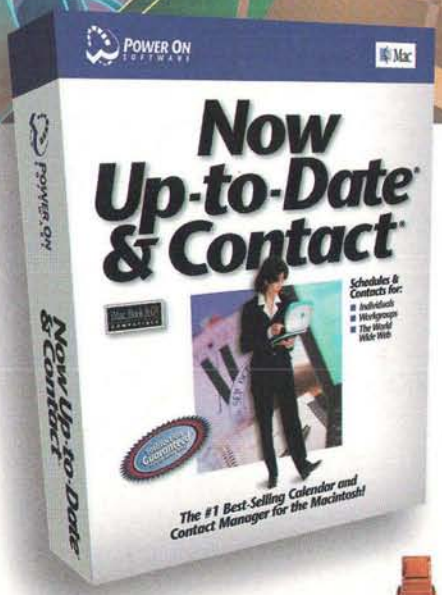

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Star Wars: Episode 1 Racer

THE GAME BEATS THE MOVIE

NOT OFTEN DOES SPIN-OFF MERchandise outdo the product from which it's spun, but minor miracles do occur. Take LucasArts' new racing game, Star Wars: Episode 1 Racer. This arcade game, in which you jet around otherworldly racecourses at terrifying speeds, is entertaining enough that it might drive away memories of the disappointing movie that spawned it.

In Racer, you command a podracer—an airborne vehicle comprising a couple of jet engines and a sleigh that flies a few feet off the ground—and dash through a series of ever more complex courses at speeds that routinely exceed 400 mph. By default, you play Anakin Skywalker, the movie's pint-size Darth Vader–to-be, and pilot Anakin's blue-and-white podracer. You can also play other characters and pilot other podracers. When you place first in each of the 25 courses (scattered among 8 worlds), you unlock a new podracer with different strengths and weaknesses.

Downhill Racer This snowy track is just one of 25 courses found in Star Wars: Episode 1 Racer.

Racer offers three modes—Tournament Play, where you tackle the 25 courses in succession and compete for prize money that allows you to purchase performance upgrades for your podracer; Free Play, where you can whirl around any track you've unlocked in Tournament mode; and Multiplayer Mode, where you can race against as many as eight players on a LAN.

LucasArts has done an excellent job of simulating the outlandish speed of these vehicles—you really feel as if you're traveling at hundreds of miles an hour. The malevolence of the other racers also enhances the game. Unlike your opponents in traditional car-racing games, in Racer they would just as soon fly *through* you as around you. Thankfully, your podracer can absorb—and dish out—this kind of damage a couple of times without crippling effects.

Some players may tire of young Anakin's alternate whining and showboating. When you lose a race, the kid lets out a mewling "Awww. . . ." And his triumphant "I won! I won!" at the end of a successful race is even more annoying. Additionally, navigating to the Settings dialog box from a race requires that you travel back through six screens, and returning to the race requires retracing the same six steps. Finally, the game doesn't natively support 3Dfx cards, though 3Dfx's latest beta drivers allow the game to run on Voodoo2 and Voodoo3 cards, with some graphics anomalies.

Macworld's Buying Advice Despite Anakin's poor-loser attitude and some interface glitches, Racer is a dizzying good time. Maybe next time around, LucasArts should forget the movie and just release the game.—CHRISTOPHER BREEN

RATING: ♦♦♦½ **PROS:** Realistic portrayal of high-speed racing; great graphics. **CONS:** Anakin is annoying; interface needs work. **COMPANY:** LucasArts (888/532-4263, www.lucasarts.com). **LIST PRICE:** $40.

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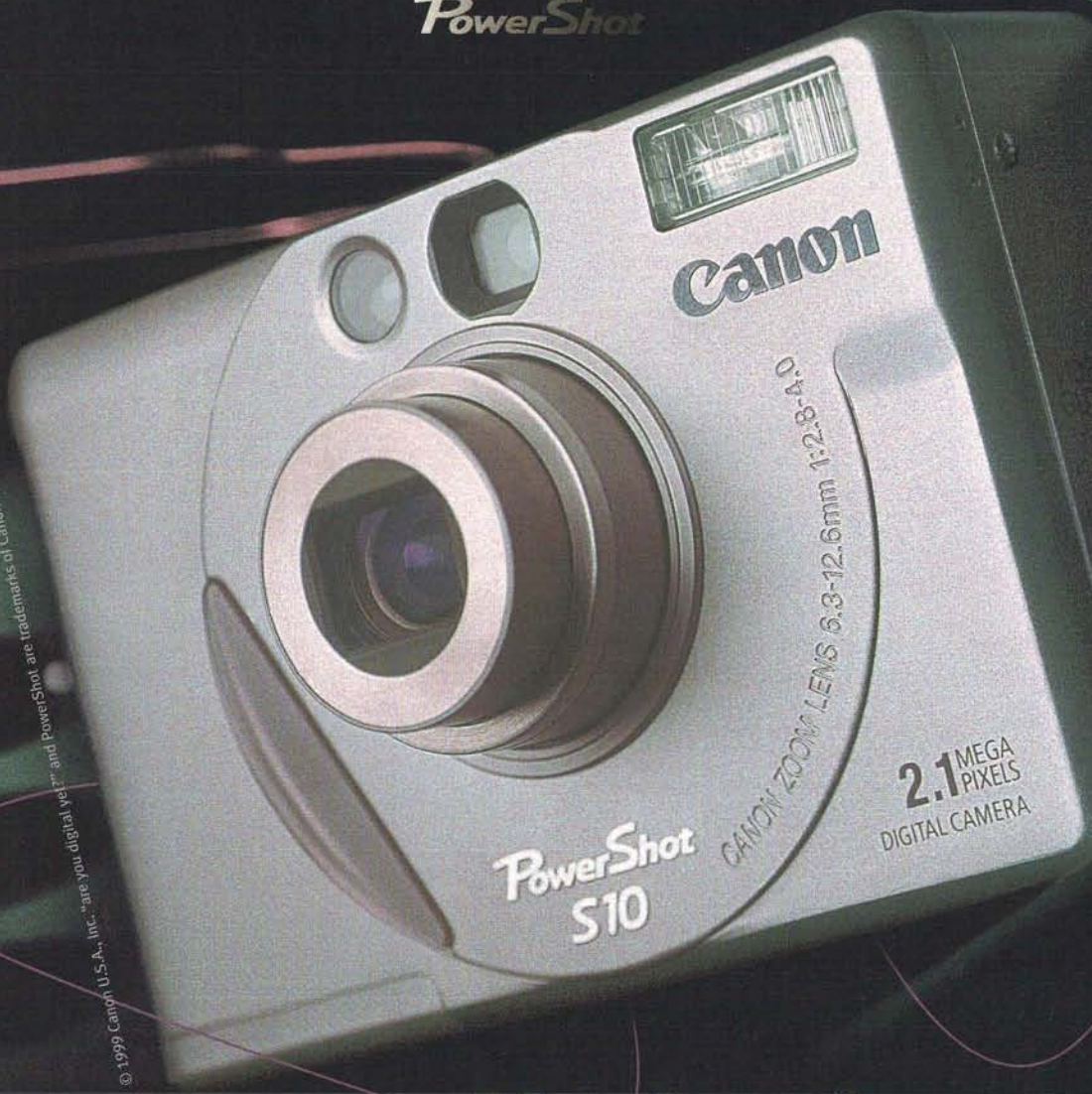

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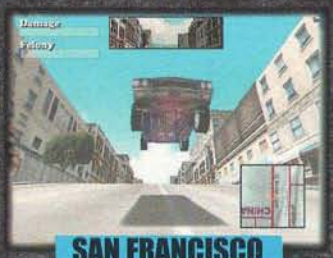

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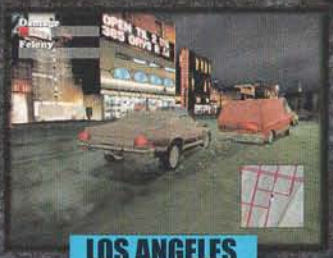

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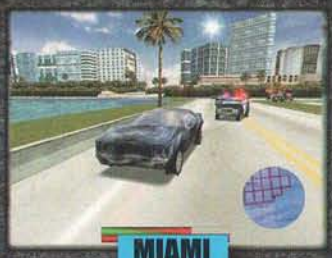

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The Game Room

Careful What You Wish For

WHY MAC VERSIONS OF HOT NEW GAMES ARE WORTH THE WAIT

by Christopher Breen

A real man—like me, for instance—knows when to admit he's wrong. I was mistaken, for example, when a few years ago I suggested to a friend—who had just joined a small Internet start-up called eBay—that online auctions had no future. Likewise, I may have been hasty when a couple of months later I turned down my friend's offer of a job at this same little auction company. "No," say I in my all-knowing way, "I'd prefer to stick with something *secure* like freelance writing!"

Now that I've stopped kicking myself, I've taken the time to readjust my thinking on another subject—one near and dear to the hearts of Mac gamers—simultaneous release. I freely admit that I was among those who championed the cause of bringing Mac games to store shelves the same day their PC counterparts arrived, but after chatting with a few of my pals in the gaming business—and watching in dumb disbelief as a potential major player in the Mac gaming market issued Mac gamers a flying triple kick to the snoot—I've changed my tune. I hope that by the end of this column you'll find the idea of simultaneous release as abhorrent as I do.

This Year's Model

To understand how a simultaneous release works, it might help to know how Mac game publishing functions today.

Let's start with the obvious: except for those games produced by the smaller Mac game publishers who build their business on the shareware model—Ambrosia and Freeverse, for example—or companies such as Pangea Software that for technological reasons make Mac-only titles, Mac-specific (or even Mac-first) game titles have almost vanished from the market. The days when a game like Myst would appear first on the Mac are over. The Big Boys can make just too darned much money on the PC platform to have much incentive for writing Mac-specific games. Mac gamers therefore depend on publishers to port PC games to the Mac.

As you're undoubtedly aware, these ported games rarely come from the original publisher—Electronic Arts, GT Interactive, Interplay, or Eidos—but rather are distributed by third-party publishers such as MacSoft, Aspyr Media, and Graphic Simulations. These Mac publishers cut a deal with the publishers of the original game—providing them with some advance money and a percentage of sales at the back end—in exchange for the PC code. Additionally, they promise not to bother the original publisher with too many technical questions, and of course they reserve the right to distribute the game and take the lion's share of the profits. Out of these profits the Mac publisher must pay the porting house—a company such as Westlake Interactive that turns PC code into something playable on the Mac—as well as pungle up the dough for duplication, packaging, advertising, and distribution. If the Mac publisher is smart, it also pays for professional beta testing by companies such as Absolute Quality or AlphaBetas to ensure that the game runs smoothly.

RICCARDO STAMPATORI

These deals benefit both parties. The original publisher takes practically no risk and earns some extra dough on a game it had no intention of porting in-house. And if the game sells well, the Mac publisher makes a fair chunk of change and can finance its next big Mac game.

The downside for Mac gamers is the necessary gap between a game's first release on the PC and its availability in Mac-compatible form. After all, you need time to convert the code, test the game, press the discs, yadda, yadda, and especially yadda. Mac publishers and porting houses attempt to shorten this gap by obtaining code while the game is still in development for the PC, but regardless of how quickly this code is delivered, a gap of several months remains between PC availability and Mac release. Neither gamers nor Mac publishers want to prolong this gap—gamers are impatient for the same cool games their PC buddies play, and Mac publishers want to take advantage of the buzz that the PC version generates.

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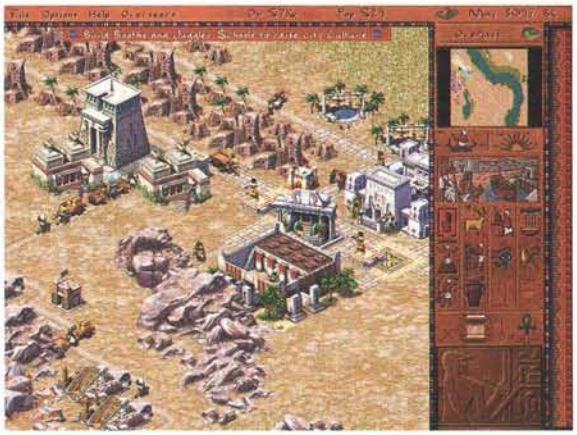

Missing in Action Unless Sierra relents, the only place you'll see these once-slated-for-Mac games—Half-Life (left) and Pharaoh—will be on a friend's PC.

The Numbers Game

These third-party publishing deals work in large part because Mac games don't sell in numbers high enough to tempt the original publishers to produce Mac versions in-house. Though 30,000 units sold is a respectable number for a Mac game, it's chicken feed to these people. There just isn't enough profit in such numbers to justify assembling a team of Mac programmers and creating a Mac-savvy marketing department.

However, thanks to the sale of over 2 million iMacs, game publishers are taking a second look at producing their own Mac ports. Who wouldn't be mesmerized by an installed base of a couple million users with machines powerful enough to run most modern games? Selling a game to just 10 percent of these users equals over 200,000 units sold—a creditable number on any platform. Of course, Apple is encouraging these publishers for the reasons you'd expect—happier Mac gamers, a well-rounded platform that appeals to potential computer buyers, and the respect that the company earns by producing a viable gaming platform.

Gazing into the Crystal Ball

Let's suppose the big publishing houses decided to jump into the Mac market with both feet. What would happen? In all likelihood, this would drive Mac publishers such as MacSoft and Aspyr out of business. Likewise, porting houses such as Westlake Interactive would be raided or run into the ground. Fine. After all, what do we care? We're getting our Mac games at the same time PC users are, and that's what's important—right?

Wrong, because gambling that these big publishing houses will *stay* in the Mac market is a sucker's bet. Allow me to illustrate my point with a fable.

Sierra's Sad Story

Once upon a time there was a company named Sierra Online. This company dipped its toe into and out of the Mac market every leap year or so. All too often, when Sierra deigned to dip its digit into our pool, the company produced distinctively dreadful ports of its PC games. To no one's surprise—except, apparently, Sierra's—Mac gamers stayed away in droves, and Sierra abandoned the Mac in a huff.

Shortly after the release of the iMac, Sierra returned to the Mac platform with a wonderful, critically acclaimed game called Caesar III. Regrettably, the game sold in disappointing numbers—around 12,000 units. With these numbers in mind, Sierra took a long second look at the upcoming Mac version of Half-Life —a terrific 3-D shooter that Logicware was porting—and although the port was on schedule and Logicware had met its assigned goals, Sierra pulled the plug. Shortly thereafter, Sierra released collections of traditional board, card, and gambling games that, on the opening splash screen, contained a large Internet button and a box that promised free Internet play. Yet Internet play wasn't available in the Mac version, as an eensy-teensy, one-line notice indicated on the inside cover of the game box. Two months later Sierra announced the cancellation of yet another title slated for the Mac—Pharaoh, a Caesar III–like game.

And you want to trust a company like this to provide you with the next generation of Mac games? I think not.

The Moral

While this story lacks a happy ending (at least so far), just imagine how dismal it would be if a similar scenario played out at Activision, Eidos, Electronic Arts, GT Interactive, id, Interplay, and LucasArts. This could very well occur without the safety net of third-party publishing houses that assume the risk of producing Mac versions of the latest hot computer games. We're talking classic double whammy—no PC publishers willing to produce Mac games and no third-party Mac publishers to take up the slack.

Look, I'm as attracted to the idea of simultaneous release as the next rabid Mac gamer is, but I believe we have to be careful what we wish for. Otherwise our dream of parity with PC players could rapidly turn into a nightmare. **m**

Visit Contributing Editor CHRISTOPHER BREEN in Breen's Bungalow, a video tutorial that appears on the CD-ROM bundled with newsstand copies of *Macworld*.

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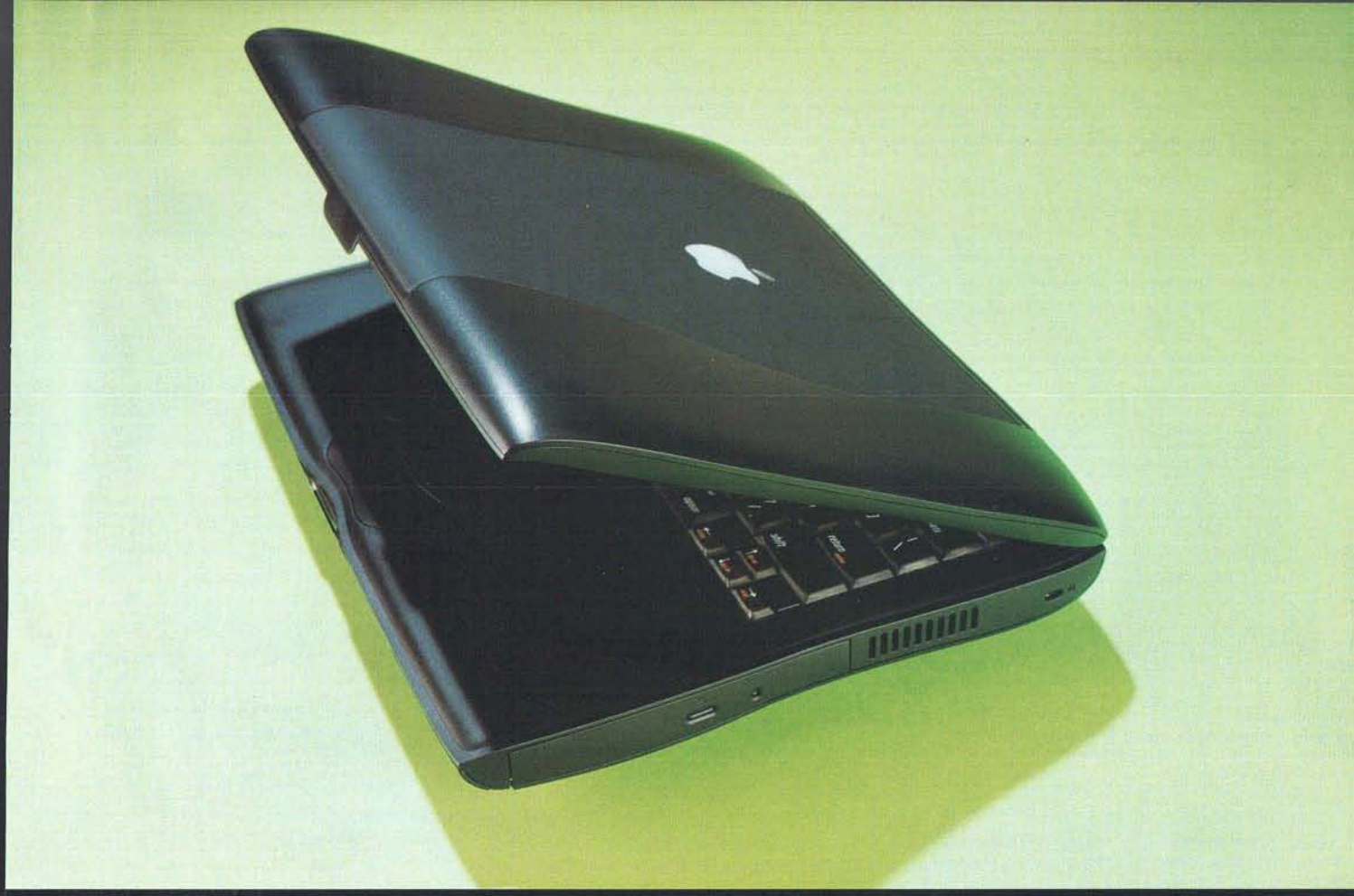
by Frith Breitzer

WHEN IT COMES TO APPLE'S NEWEST MOBILE MACS,

Ever since Steve Jobs returned to Apple, we've come to expect drama when the company introduces new products, whether they're colorful and cuddly iMacs or shocking-blue Power Macs. But sometimes the most-dramatic changes don't have to do with a flashy appearance—they're all about what's inside.

That's certainly the case with the latest updates to Apple's line of portable Macs, the PowerBook and the iBook, announced at Macworld Expo Japan in February. The PowerBook, whose name has been officially truncated from the previous "Macintosh PowerBook G3," hasn't been redesigned into a translucent, fruit-flavored gadget—it's a dead ringer for last year's



INNER BEAUTY

LOOKS CAN BE DECEIVING

model, right down to the bronze-colored keyboard. But in truth, this PowerBook is dramatically different, with a blistering G3 processor, FireWire connectivity, AirPort support, and much more.

In contrast, the new iBook Special Edition adds a third color to Apple's line of consumer portables, but beneath the skin it's largely the same iBook Apple announced last fall. (See the sidebar "iBook Gets Brawny" for details about all the new iBooks.)

That's the funny thing about appearances—they can be deceiving. When it comes to actually *using* your Mac, the real substance is on the inside, and that's where Apple's new PowerBook really shines.

Photography by Kevin Candland

iBook Gets Brawny

THE iBOOK, RELEASED LAST SEPtember, offered a new take on a low-cost portable—one with style and good performance. However, in order to achieve the $1,599 price, Apple skimped on built-in storage and RAM. It was the latter item that caused the most trouble, because with only 32MB of RAM, the iBook not only had barely enough memory to run one application, but also exhibited stability problems (these vanished when the base configuration was expanded to 64MB; see *Reviews,* January 2000).

More Bang With the release of the 2000 iBook, which started shipping in February, Apple boosted the on-board RAM to where it should've been in the first place: 64MB, bringing the iBook in line with the rest of the Mac product lineup (for details, see the table "Bigger, Better, Grayer"). It also doubled the iBook's anemic internal hard drive from 3GB to a much more spacious 6GB of storage, a necessity these days if you carry around lots of MP3 files or need many applications loaded on your computer. The processor speed stays the same at 300MHz, but as a result of the RAM boost, the iBook should seem much faster to users who have been struggling with the 32MB version of the portable. And for those who find even 64MB of RAM too meager, the 2000 iBook can handle up to 320MB of RAM, double the previous maximum of 160MB.

All other specifications stay the same: built-in 10/100BaseT Ethernet networking, a 56-Kbps modem, a 2× AGP ATI Rage Mobility graphics controller with 4MB of SDRAM, a 24× CD-ROM drive, a USB port, and a 12.1-inch active-matrix display capable of a maximum resolution of 800 by 600 pixels. Since the price remains $1,599, the blueberry and tangerine iBooks are now an even better value than before.

The Graphite Blues Too bad the same can't be said for the iBook Special Edition (SE), which comes in a slick new "graphite" (gray) and "ice" (white) case.

Except for the gray rubber bumpers, which are semitranslucent, unlike their blue and orange counterparts, the only difference between an ordinary iBook and a Special Edition is an additional 66MHz of processor speed—and an additional $200 tacked on to the price. The 366MHz iBook SE retails for $1,799.

Though Apple claims that the jump in speed and sexy new color are enough to justify the extra expense, our initial reaction is less enthusiastic. Consider that the jump from the $1,299 iMac DV to the $1,499 iMac DV Special Edition includes more RAM and a larger hard drive (and both models include Apple's great new iMovie software).

On the other hand, users who were reluctant to be seen in public carrying a tangerine or blueberry iBook by its purselike handle may find the slightly faster, more businesslike iBook Special Edition worth the price.—ANDREW GORE

Bigger, Better, Grayer

Product	List Price	Processor	RAM/ Maximum	Hard Drive	Optical Drive	Color
iBook (1999)	$1,599*	300MHz G3	32MB/160MB	3GB	CD-ROM	tangerine, blueberry
iBook (2000)	$1,599	300MHz G3	64MB/320MB	6GB	CD-ROM	tangerine, blueberry
iBook Special Edition	$1,799	366MHz G3	64MB/320MB	6GB	CD-ROM	graphite

No longer sold.

Familiar Faces

The first thing you'll notice about the new PowerBooks is that their prices haven't changed—still $2,499 to $3,997 (see the table "The Name Game" for details).

The familiar expansion bays are still there, and they work with batteries and expansion drives from last year's PowerBook. The PC Card slot hasn't disappeared either; it still supports the same cards as the old machine, including Type I and Type II PC Cards and Zoomed Video PC Cards.

Lift the new PowerBook, and you'll find it a little lighter than the previous version. It weighs in at 6.1 pounds—5.7 pounds with only the battery and a weight-saving module (essentially a hollow battery case) in the second slot—compared with the 6.2 pounds of the older high-end system.

Open the PowerBook, and you'll see the same bronze keyboard and bright 14.1-inch active-matrix LCD panel. Even battery life remains the same: Apple estimates that you'll get five hours of life out of each charge (or double that with a second battery installed).

Close Inspection Take a closer look and you'll notice some subtle differences. The blinking sleep-indicator light has been replaced by a gently pulsing one. And the old, solid-black accessories have been replaced by snazzier ones—the PowerBook comes with a round, silver power-cord holder and an AC adapter similar to that of the iBook. Even the VGA adapter has an "ice" color scheme. Under the display, the moniker reads simply "PowerBook," reflecting Apple's current minimalist approach to naming its systems.

It's when you turn the new PowerBook around and open the rear port door, however, that you begin to realize that the real story behind the latest PowerBook is on the inside.

Rear Window

Fire When Ready

When it comes to connecting other devices to this PowerBook, you'll be glad to find that most of the ports you're used to are still there (see the photo "Rear Window"). Instead of the SCSI port, however, there are two FireWire ports.

The new FireWire ports operate on a single bus and are powered. That means the peripherals you attach to them can draw their power from the PowerBook—though that will drain your battery faster—without needing a separate power supply (see "Where's the Fire?" November 1999). The FireWire ports can support a combined total of 63 peripherals, including additional hard drives and digital video cameras (see the sidebar "Mobile Moviemaking?").

Also gone is the SCSI Disk Mode option, which let you hook up the PowerBook to your desktop Mac via SCSI so that one machine's hard drive appeared on the other's desktop. It's been replaced by FireWire Target Disk mode. Even better, the new PowerBook can boot up from an external FireWire hard drive.

The 2000 PowerBook also offers the same two independently powered USB ports included in the previous line, allowing you to connect a total of 127 hot-swappable USB devices.

Speed Demon

Moving deeper inside, you'll discover that the new PowerBooks are available in 400MHz and 500MHz G3 PowerPC configurations. If you're hoping for a G4 notebook, though, you still have to wait: the current G4's high power consumption and resulting heat continue to preclude it from being used in portable Macs. (See *News*, elsewhere in this issue, for the latest on G4 desktop systems.)

On the other hand, you can expect to experience CPU performance levels nearing those of the latest G4 computers on applications that don't take advantage of the G4's Velocity Engine (for details about this technology, see "Fantastic Four," November 1999). The G3 PowerBook steps up its system bus speed to 100MHz (from 66MHz), bringing it up to par with the Power Mac G4s. In addition, all new PowerBooks standardize on a 1MB Level 2 backside cache, resulting in increased speed and stability.

Great Graphics

Graphics professionals and gamers should be pleased with the PowerBook's graphics performance. It ships with the speedy ATI Rage Mobility 128 graphics chip set with AGP 2× support for 2-D and 3-D graphics, and 8MB of SDRAM video memory. Though not as powerful as the graphics card on the G4 desktop, the card should offer impressive portable graphics performance—meaning higher frame rates in your favorite scoot-and-shoot games and increased responsiveness in graphics-intensive applications. You'll also be able to see those gory games (or your presentations and designs for work) in living color. The monitor supports millions of colors at a resolution of 1,024 by 768 pixels and scales down to 800 by 600 or 640 by 480.

I Want My DVD To showcase that graphics power, all 2000 PowerBook models ship with a 6× DVD-ROM drive (only high-end

The Name Game

Product	List Price	Processor	RAM/ Maximum	Hard Drive	Optical Drive	Spare Battery and Adapter
PowerBook	$2,499	400MHz G3	64MB/512MB	6GB	DVD-ROM	no
PowerBook	$3,499	500MHz G3	128MB/512MB	12GB	DVD-ROM	no
PowerBook	$3,997	500MHz G3	128MB/512MB	18GB	DVD-ROM	yes

All systems include a 1MB backside cache and a 100MHz system bus.

models included DVD in 1999). The new DVD drive can read DVD-ROM, DVD-Video (movies), and—a first for PowerBooks—2.6GB DVD-RAM media. The drive can also read CD-ROMs at up to 24×.

Getting Air

It's no secret that Apple has been striving to include AirPort compatibility in all its models so that all Mac users can enjoy this new wireless way to surf the Internet and network multiple Macs. With the new PowerBooks, the company can cross that item off its to-do list. Lift up the keyboard and you'll discover a slot for an optional $99 AirPort networking card, which enables the PowerBook's built-in AirPort antenna. In addition, you'll find access to the hard drive and RAM expansion bay (see the photo "Inside Scoop").

The 2000 PowerBook also includes the latest AirPort 1.1 software, which allows you to use any AirPort-equipped Mac as a base station. You'll avoid the $299 cost of a hardware base station, but you'll need to keep your PowerBook hardwired to your network, and this will affect its portability.

AirPort 1.1 also improves compatibility for users who had trouble connecting their AirPorts to their Internet service providers (although connecting to America Online via AirPort was still not possible at press time). An active roaming feature allows the AirPort connection to seamlessly transfer to the closest AirPort Base Station if you're in an environment that has more than one, such as an office or school.

Inside Scoop The PowerBook's flip-up keyboard provides access to **(A)** the AirPort card slot, **(B)** the hard drive, and **(C)** the RAM slot.

The Last Word

Regardless of where you choose to use your new PowerBook, you'll have three configurations to consider.

For $3,499, you'll get a 500MHz G3 processor, 128MB of RAM, a 12GB hard drive, and a DVD-ROM drive. The $3,997 system pumps up the hard drive to 18GB and includes a second battery (normally $129) and an extra AC adapter (normally $69). You can also specify your own built-to-order configurations with up to 18GB of hard-drive space and 512MB of RAM by visiting the Apple Store (http://store.apple.com).

But the low-end configuration is the most impressive. It offers a 400MHz processor, 64MB of SDRAM, a 6GB hard drive, and a DVD-ROM drive for $2,499. If that's still too steep, you might also consider a revamped iBook, which now features more memory and a bigger hard drive than its predecessor, as well as a new color (see the sidebar "iBook Gets Brawny").

With the introduction of the new PowerBook, Apple now offers a completely integrated product line. All systems feature AirPort compatibility, and most—with the exception of the iBook and low-end iMac—include FireWire ports and DVD drives to take advantage of desktop video capabilities. The best news about the 2000 PowerBook is that it takes what was superb about the PowerBook and makes it even better. **m**

Assistant Editor FRITH BREITZER covers displays, imaging hardware, and anything big that Apple announces at Macworld Expo.

Mobile Moviemaking?

THE 2000 POWERBOOK HAS ALL THE BELLS AND WHISTLES NECESSARY TO BE A no-compromise portable digital video-editing system. Unfortunately, despite its brilliant design, extensive feature set, and incredible value, the new PowerBook gets you only halfway to mobile moviemaking.

Video Void Unlike the iMac DV, which includes Apple's iMovie editing software, the PowerBook does not include any digital-video software. Should you want to turn your new PowerBook into a video-editing studio, you'll need to pay extra for the necessary software. And the amount you'll fork over isn't necessarily insignificant: Apple does not offer its easy-to-use iMovie software independent of the iMac DV, which means you're forced to choose Apple's $999 Final Cut Pro, another high-end program such as the $549 Adobe Premiere (800/833-6687, www.adobe.com), or an entry-level option such as Digital Origin's $149 EditDV Unplugged (800/572-3487, www.digitalorigin.com).

Desktop video is one of Apple's main focuses for the year 2000. However, by not including at least an entry-level video-editing application with the new PowerBook, the company has missed an ideal opportunity to promote DV to an important new audience: the mobile professional.

Just because people buy a "pro" Mac—such as the 2000 PowerBook—doesn't mean they're high-end users across the board. In combination with iMovie, the new PowerBook could be a great desktop video ambassador. And professional digital video users would still have the option of upgrading to Final Cut Pro to meet their more demanding requirements.—ANDREW GORE

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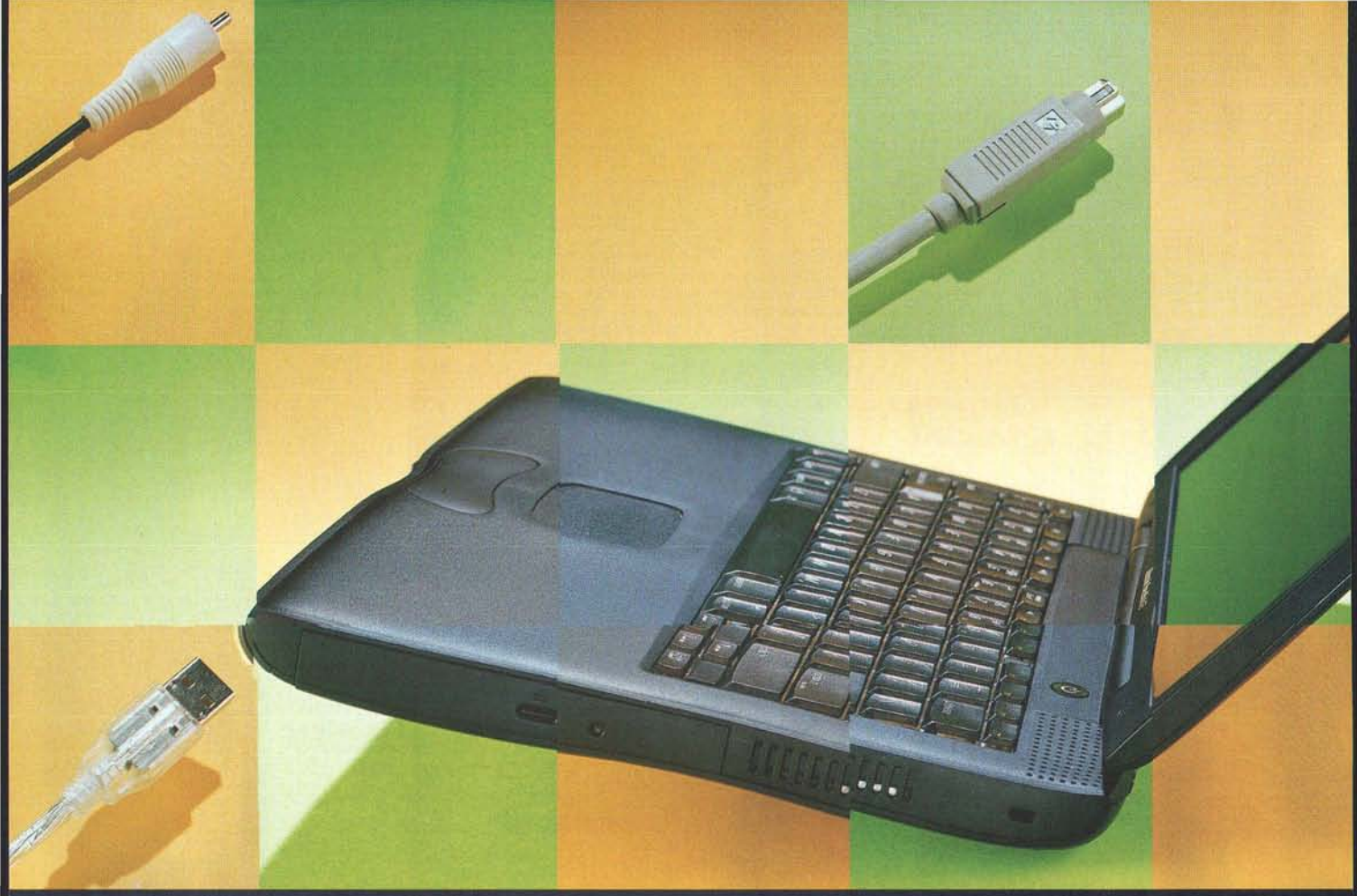


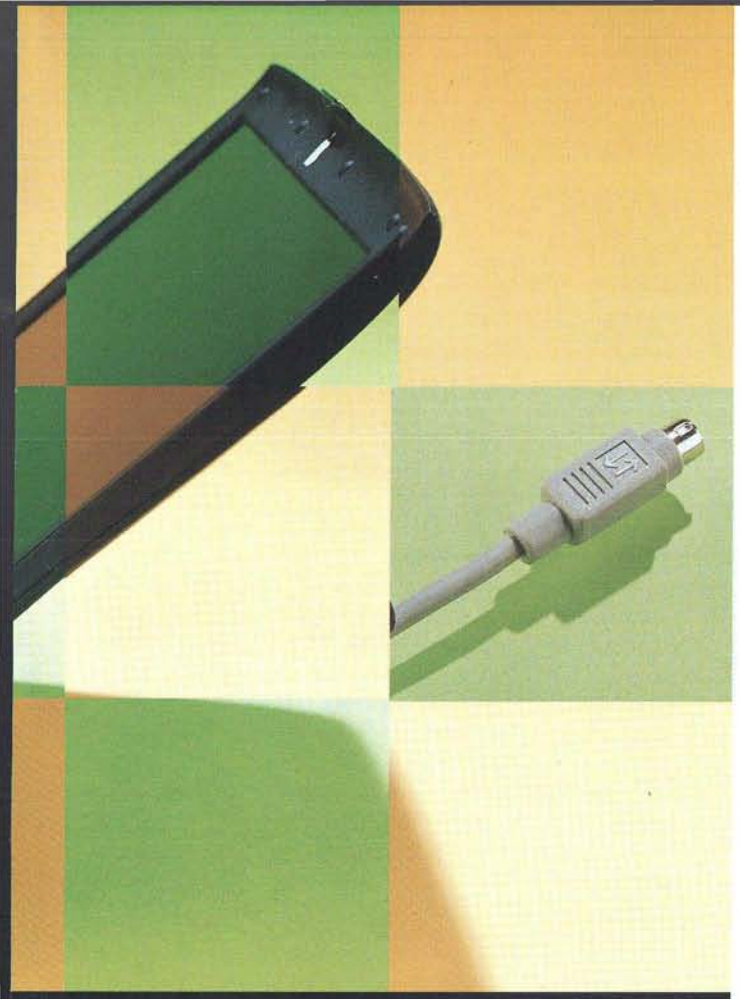
INSIDE INFORM

EXPERT TIPS TO HELP YOU USE YOUR

When you're more often on the road than in the office, chances are you depend on your PowerBook—if not for your life, then at least for your money. But Apple's laptops have their idiosyncrasies, and travel brings its own challenges. Most of us have been caught at least once without a way to print, connect to a monitor, or jack into a network. In these situations—from the embarrassing to the deal breaking—even seasoned users can use a little expert help.

That's where we come in. Whether your portable pal has a fresh face (see the feature "Inner Beauty," in this issue) or is somewhat long in the tooth, our insider tips will keep it running at its best and save you from "gotchas" that can wreak havoc on your workday.

by Jason D. O'Grady



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POWERBOOK LIKE A PRO

PHOTOGRAPHY BY KEVIN CANDLAND

Security Blanket

You love your PowerBook because you can sling it around without breaking a sweat. Thieves love that, too. Beware a common airport scam that involves a decoy stalling as he or she goes through the security check's metal detector while an accomplice grabs your computer as it comes through the baggage scanner.

PowerBook ownership also poses another kind of security threat. Whether you fear theft or simply share your laptop with coworkers, you should keep your data secure. The simplest way to protect your information from prying eyes is built right into the Mac OS. The Password Security control panel activates a password screen any time your machine wakes from sleep mode or restarts. Password security is relatively easy to foil, but it can keep casual snoops at bay.

In OS 9, you can restrict access to certain applications and folders via the Multiple Users control panel. Multiple Users lets you specify how much access each individual has and to which files. It's also useful for shared PowerBooks because it saves each user's systemwide preferences along with the log-in information.

But say you're out hawking the idea of the century. If your data gets into the wrong hands, your dreams of a multibillion-dollar buyout go down the drain. You need serious security, such as Power On Software's $80 Disk Lock (800/344-9160, www.poweronsoftware.com). It encrypts files in two ways (including DES, the U.S. government standard) and protects them against deletion.

Another security program, ASD Software's $139 FileGuard (909/624-2594, www.asdsoft.com), boasts four ways to encrypt data, including Triple DES. The cool part is that you can send encrypted files electronically to any Macintosh user, regardless of whether they use FileGuard.

Cables and Connectivity

Even road warriors can't live by laptop alone. Sooner or later, you'll want to hook up to speakers, connect to a network, or otherwise reach beyond your PowerBook.

Now Hear This You can attach speakers via the stereo audio-out port located next to the power adapter plug on the PowerBook's back plane. A standard ⅛-inch stereo miniplug, like the one on a Walkman-like portable stereo, handles sound out. If you also have a standard dual RCA cable (available in electronics stores and Mac catalogs for about $2), you can send audio out to most consumer electronics devices.

Capture Sound A PowerBook isn't exactly a recording studio, but when you need to capture audio with it, you can connect a microphone to the audio-in port. One caution: that port requires a powered microphone—and most mikes are not powered. The $20 NE Mic Audio Adapter from Griffin Technology (615/255-0990, www.griffintechnology.com) comes to the rescue.

Attach SCSI or FireWire Devices When you want to attach an external device such as a hard drive or CD drive, pick high-speed communications cables based on the PowerBook model you own. If your model has SCSI ports, pack an HDI-30–to–25-pin SCSI adapter, such as APS Technologies' $30 SCSI Doc (816/483-2749, www.apstech.com). You'll need this handy adapter to make the square SCSI port on your PowerBook work with standard SCSI cables.

You may also want to try out SCSI Disk Mode, which lets you mount your PowerBook as a hard drive on another Mac-

FireWire Tips, Gadgets

FIREWIRE IS A SUPERFAST WAY TO TRANSFER DATA TO AND from your PowerBook. A new PowerBook model, code-named Pismo, was recently released with built-in support for FireWire. (See the feature "Inner Beauty," in this issue.) And thanks to FireWire PC Cards that fit in the CardBus slot, any G3 PowerBook running at 300MHz or faster can join the party.

FireWire PC Cards are available from many vendors, including RATOC Systems (408/955-9229, www.rexpccard.co.jp), Newer Technology (316/943-0222, www.newertech.com), VST Technologies (978/263-9700, www.vsttech.com), and Orange Micro (714/779-2772, www.orangemicro.com). For more information on the first two cards, see *Reviews*, February 2000.

Because these cards work only in a CardBus slot, any PowerBook older than the Wall Street model can't use them without modification. If you've got an older model but are still frantic for FireWire, check out MCE's CardBus upgrade (www.powerbook1.com/cardbus.html).

Models with built-in FireWire have at least one crucial advantage: they can power FireWire devices through the cable. Try the same thing with a FireWire PC Card and it will overheat. (However, the RATOC card's power jack is on the dongle that connects FireWire devices to the card, thus avoiding the problem.)

Because digital video is such a data hog, video editors on the go are sure to be among the loudest voices welcoming FireWire. FireWire cables can have four or six pins; if you'll be working in an unfamiliar video studio, bring both kinds.

Many of the new digital video cameras boast FireWire input and output and are small enough to take on the road. See "Camcorder Casting Call," April 2000, for a look at five cameras that start at $1,000. *Macworld*'s Editors' Choice, the Sony DCR-TRV10, costs $1,800 (800/222-7669, www.sel.sony.com).

Mobile video editors won't be the only people enjoying the size and speed of portable FireWire hard drives. VST Technologies' "thin" drives hold from 4GB ($360) to 25GB ($1,100) and fit in your hand. LaCie (503/844-4500, www.lacie.com) makes the PocketDrive, which holds from 6GB ($399) to 18GB ($749). It also includes USB connections for greater flexibility.

Sometimes the simplest things can give you a big performance boost. Make sure you've installed the most-current Apple and device drivers. For Apple's latest, go to http://asu.info.apple.com. For device drivers, go to the appropriate vendor's site.—TERRI STONE

intosh. This is especially useful when you need to copy a lot of files between a PowerBook and a desktop machine. To enable SCSI Disk Mode, start with the PowerBook Setup, PowerBook SCSI Disk Mode, or PowerBook SCSI Setup control panel (depending on which system you have).

Open the control panel, select the SCSI ID you want for the PowerBook (1 through 6), then shut down both machines and connect them via a SCSI cable and SCSI Doc. Your PowerBook hard drive will mount on the target machine like any other drive. For information on attaching FireWire devices (not possible with all PowerBooks), see the sidebar, "FireWire Tips, Gadgets."

Connect to Ethernet When your work environment may involve Ethernet, carry both straight and crossover Ethernet cables with you. The first allows you to jack into almost any corporate network; the second lets you connect directly to any other Ethernet-equipped Mac, no hub necessary. Both cost less than $10 from a variety of sources. If your PowerBook doesn't support Ethernet (that is, if you have a pre-3400 model) and you need that kind of connectivity, it may be time to buy a newer model.

Connect via Serial If your PowerBook has a serial port (Wall Street or any prior model), don't forget a Mini Din8 serial cable (aka an ImageWriter cable). This cable can save your bacon when it comes to those smaller file transfers. Just connect two serial-equipped Macs with the Din8 cable, and then create a two-computer micro LAN by enabling File Sharing and selecting the target Mac in the Chooser. But keep in mind that the small data pipe will have you tearing out your hair if you try this trick with larger files.

Make E-mail Easy Do you live for e-mail? Then save yourself the struggle of trying to stretch the 6-foot cable that came with your modem past the corner of your hotel bed. Instead, plunk down a mere $2 to $5 for 10- and 15-foot standard telephone cables (known as RJ-11 cables, these are available from the usual Mac sources). Pick up a $1 RJ-11 coupler, too—very handy when you have to connect two RJ-11 cables to reach that faraway plug.

Accessible Adapters

Adapters can bail PowerBook users out of many a tight situation, such as connecting to an unfamiliar video projector

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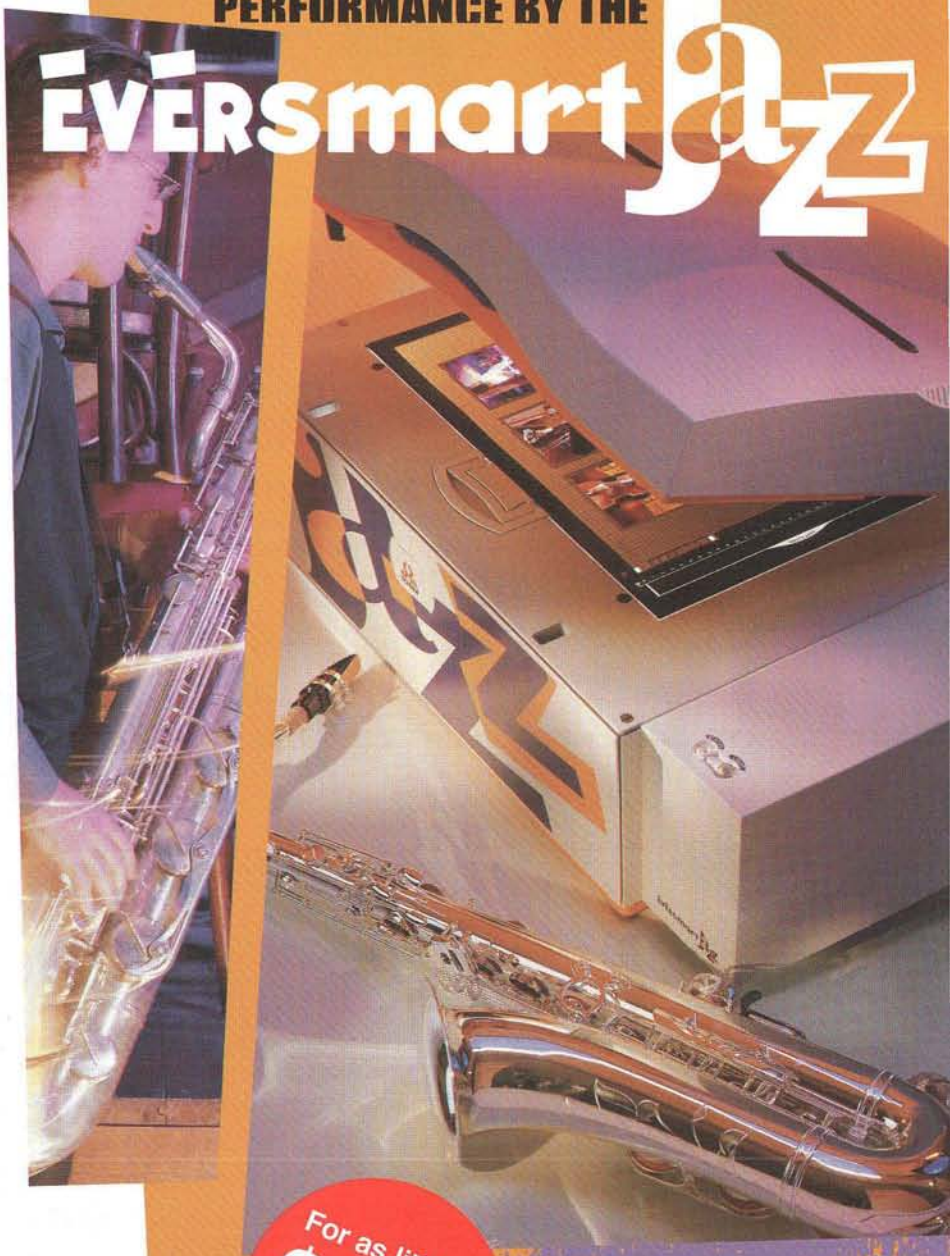

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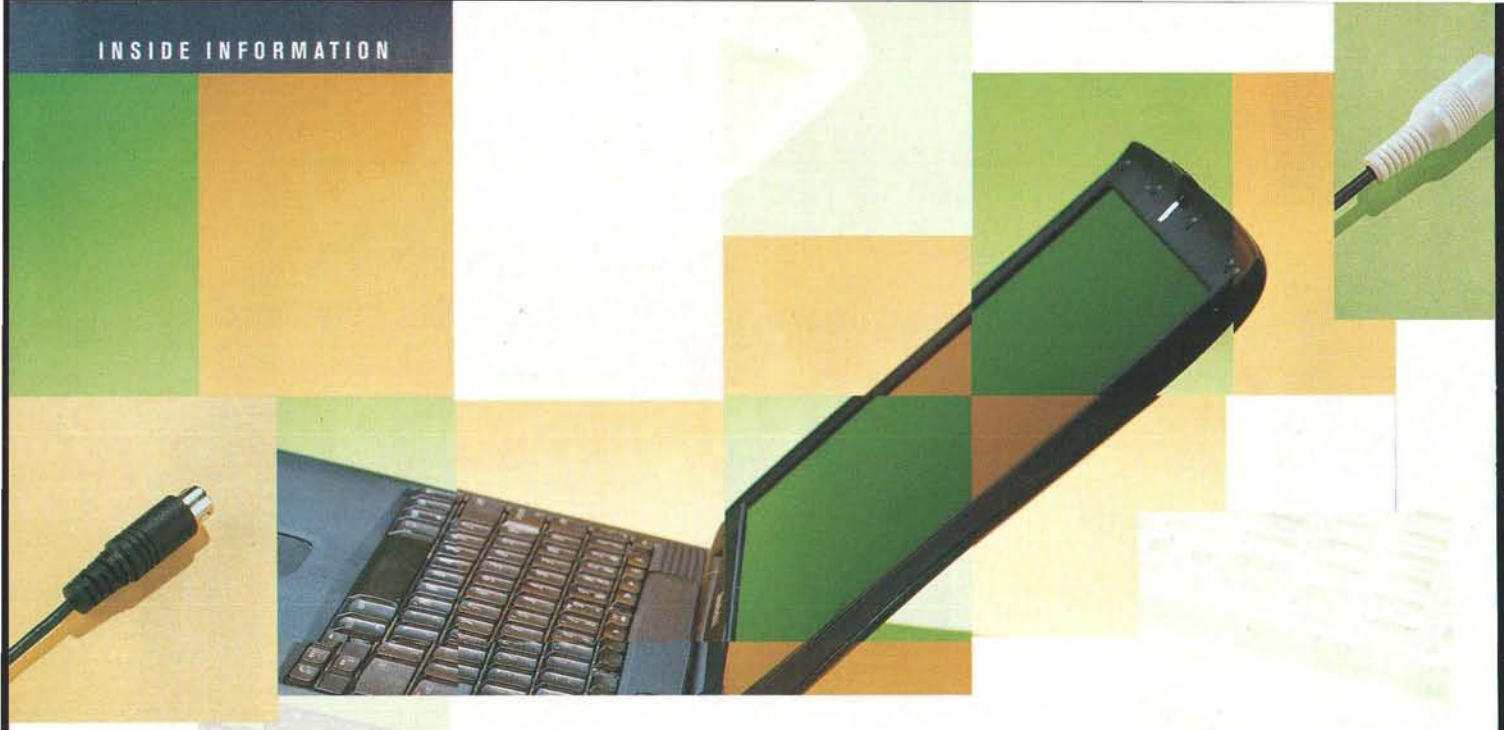

or printing a revised proposal on the spot at a client's office.

Professional Presentations Imagine you've flown across the country to pitch your brilliant business plan. You set up your PowerBook—and realize you've forgotten a crucial adapter. Don't make the management team huddle around your unimpressive small screen—always come prepared with the right adapter for the job. Here's what you need.

Monitors and video projectors usually connect via a VGA-style video cable. If you have a pre-3400 PowerBook, carry a Macintosh-to-VGA video adapter. If your model is a 3400 or newer, don't forget to pack the VGA-to-Mac adapter that ships with the laptop—it connects your PowerBook to older Apple monitors. Owners of the G3 series (Lombard and Wall Street) can use the included adapter for S-Video to composite video.

Cross-Platform Printing If you often print in cross-platform environments, Infowave's $100 PowerPrint USB (800/463-6928, www.infowave.com) may answer your prayers. Combining software and a USB-to-parallel cable, this package lets you print to over 1,600 PC printers from a PowerBook.

"Incompatible" Bronze Mac Owning the newer PowerBook models (starting with the 1999 Bronze G3) presents special challenges. They were the first to ship without serial and Apple Desktop Bus (ADB) ports. Apple replaced both aging technologies with Universal Serial Bus (USB) ports, alienating you from a world of perfectly functional but no longer compatible serial and ADB devices.

Two indispensable tools help owners of bronze G3s stay connected. The first is Keyspan's $79 USB Twin Serial Adapter (510/222-0131, www.keyspan.com). It plugs into one of your USB ports and gives you two serial ports—an absolute necessity for connecting to many PDAs, graphic tablets, modems, and printers.

Griffin's $39 iMate is another money saver if you've already invested in a slew of ADB devices. Plug this compact, Bondi-blue adapter into your PowerBook and you can connect to ADB keyboards, mice, trackballs, touchpads, and hardware dongles.

Networking sans Wires

Wireless networking means you can forget about fumbling with Ethernet or serial cables—go wireless instead.

Apple's wireless wonder, AirPort (which consists of the $99 AirPort PC card and the $299 AirPort Base Station), is built into only some versions of the iMac and iBook, the PowerMac G4, and the newest PowerBook. But this doesn't completely deal users of older PowerBooks out of the wireless game.

If you have a Wall Street or Lombard PowerBook, you can add a Lucent WaveLAN Silver PC Card (www.wavelan.com) or Cabletron Wireless High-Rate PC Card (www.cabletron.com) for as little as $166. Both of these identical cards are compatible with Apple's AirPort Base Station.

AirPort aside, another wireless option is Metricom's Ricochet SX (408/399-8200, www.metricom.com), which delivers a constant Internet connection for a flat monthly fee. Ricochet gives you a solid 28.8-to-33.6-Kbps wireless connection via a small serial modem you attach to the lid of your PowerBook. Although Metricom doesn't officially support mobile connections, you can easily use the service while traveling at under 35 mph. Service is currently limited to a few urban areas, but a 128-Kbps version of the Ricochet service is due out in 12 major markets this summer.

Backup Blues

We all know that backing up is a good idea, so why do we do it so infrequently? Modern PowerBooks have expansion bays that accommodate Zip and expansion-bay hard drives, which could make on-the-road backups more palatable. The Zip drive will set you back about $230, and the expansion-bay hard drives start at $390 for the 6GB configuration. Both are available from VST Technologies (978/263-9700, www.vsttech.com). For backups at the office, you can attach any SCSI (or FireWire, if you use the newest PowerBook) hard drive.

The Last Word

PowerBooks let us squeeze more work out of situations in which we used to jot notes on random scraps of paper or read in-flight magazines. That doesn't mean they're free of quirks and complications. Keep our advice in mind, and your PowerBook will bring you satisfaction, not aggravation. m

JASON D. O'GRADY (jason@go2mac.com) is editor in chief of Go2Mac.com and a member of the Macworld Expo Conference Faculty.

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The best thing about the Web is that it contains just about anything you'd ever want to find. The worst thing about the Web is that sometimes it's almost impossible to find what you want. The bigger the Internet gets, the more difficult it is to focus in on what you're looking for among its 800 million Web pages—and the more important it is that you learn how to search the Web effectively.

Notice that we said *effectively*. It's easy to search the Web these days, but in most cases, you can't easily find what you want—or you *do* find what you want, but it's mixed in with irrelevant sites. Cast your line into the Web ocean with some search engines, and you're likely to find 43,965 sites wriggling on your hook.

There's no need to slog through tons of results, hoping that you stumble across what you're looking for. You can be an expert Web searcher, reaching your destination with a minimum of fuss (as well as fewer visits to out-of-the-way, irrelevant sites). It's as easy as choosing the right search sites—we'll show you how—and following our advice to expertly home in on what you seek. Once you've learned the skills, you'll view the Web as the world's biggest library—not as the world's biggest haystack with a valuable needle lodged deep inside.

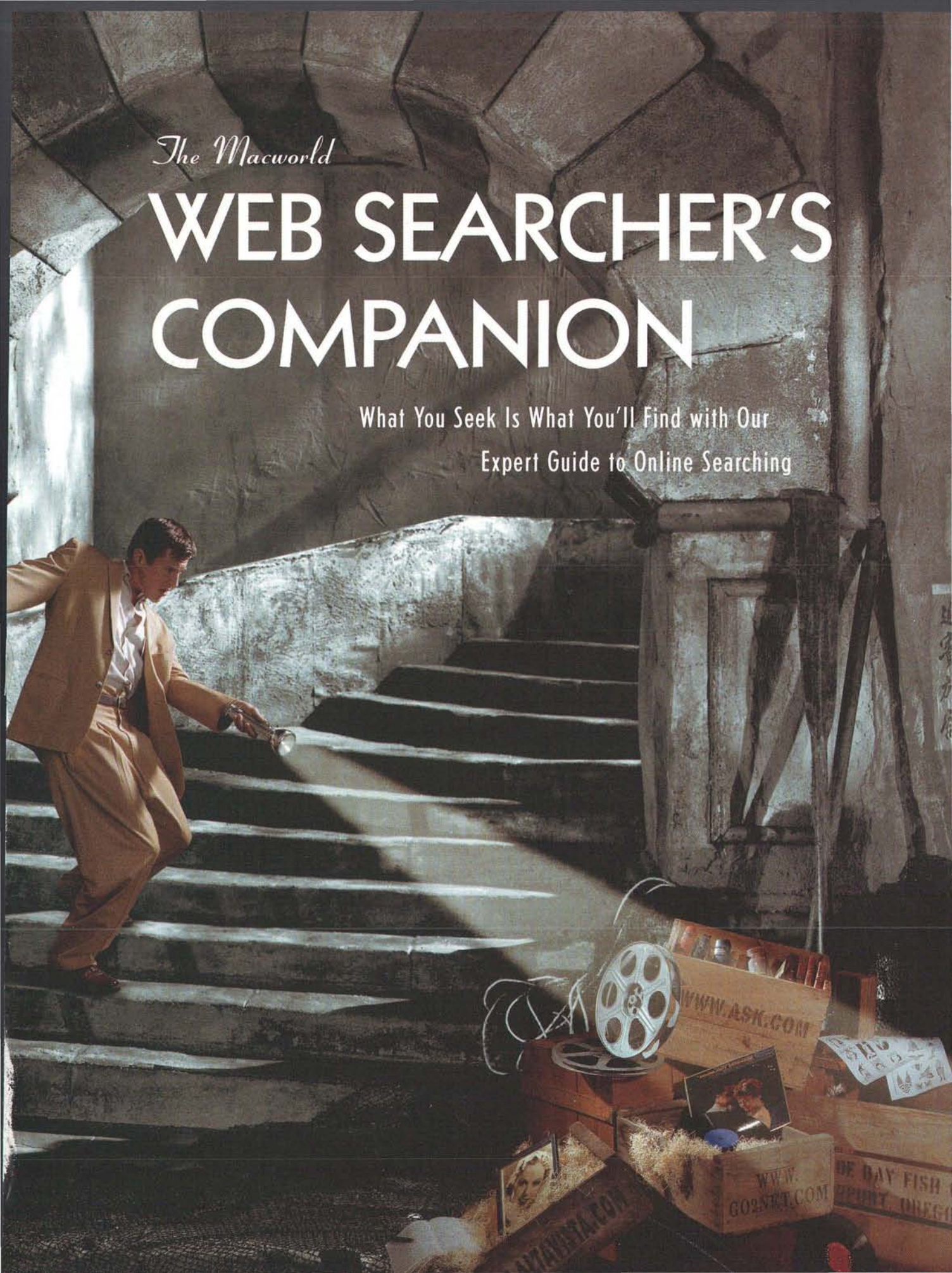
by Tom Negrino

THE MACWORLD PART 4 WEB COMPANION

The Macworld

WEB SEARCHER'S COMPANION

What You Seek Is What You'll Find with Our Expert Guide to Online Searching



Know Your Tools

When you start searching, knowing a bit about the tools you're using helps. The most basic distinction between Internet search sites is that some are *search engines* and others are *directories*.

Search Engines A search engine builds an index by using pieces of software called *spiders*, which crawl the Web, indexing pages as they encounter them. Spiders return to a site periodically to check for changes, and the changes eventually get posted to the search engine's index.

Search engines rely on keyword searching—you type a word or a string of words, and the site searches its index for those specific words. Web-site designers can affect how highly their site is ranked by search engines, with careful selection of page titles, body copy, and invisible HTML tags called metatags. (If you're interested in the ins and outs of search engines and how to design Web pages with their capabilities in mind, check out Search Engine Watch, at www.searchenginewatch.com.)

The metatag system should give you nicely relevant results, but many Web designers manipulate this system by filling their metatags with lots of extra information. For example, some search engines used to judge a Web site's relevance to a particular topic by how many times that topic was mentioned on the site. Sneaky Webmasters simply put a couple hundred repetitions of the topic keyword into the page's metatag or put hidden text on their pages that was the same color as the page's background color. A reader couldn't see the hidden text, but search engines could.

Most often used by pornography sites, these methods of duping search engines have become so rampant that they've developed a name: *spamdexing*. The better search engines have fine-tuned their indexing software to exclude most spamdexed results, but some lag. If you use Excite (www.excite.com) or Lycos (www.lycos.com) to search for *Monica Lewinsky*, for example, you'll get links to porn sites as your top results.

Power Tool AltaVista's advanced search terminology may not be intuitive, but it can help you find almost anything, no matter how obscure.

The Best Ones One of the oldest (and still among the best) search engines is AltaVista (www.altavista.com). It has one of the largest indexes, which is important, since a larger index means the engine covers more of the Web and your search will more likely be successful. (See the screen shot "Power Tool.")

Google (www.google.com) has been around only since 1998, but it's already become a major player, thanks to its superb ability to find relevant results. Google lets you search by keyword, but it ranks its results based on how many other sites have linked to the sites that contain the term that you're looking for. The logic here is that if a bunch of sites link to a particular site, that site is more likely to have useful information. Google recently announced a specialized Apple-specific search engine (www.google.com/mac.html) that is devoted to information about Macs and Apple.

When to Use a Search Engine Search engines shine when you're looking for a topic that can be easily described by a keyword as well as when you're looking for things that are very spe-

PREVIOUS PAGES—PHOTOGRAPHY AND DIGITAL IMAGING BY MARK JOHANN / BACKGROUND IMAGE: THE KOBAL COLLECTION
ILLUSTRATIONS BY PAUL ROGERS

Best Place to Find Music

MP3.com (www.mp3.com)

You've got to love a technology that makes acquiring and listening to music easier while simultaneously scaring the pants off fat-cat record-company moguls. MP3 audio has achieved those goals. Most people are using MP3 programs just to rip their CD collections to their hard disks so they can cart them around on an iBook or download them to a sporty MP3 player. But there are many musicians who use easily transportable MP3 files to reach a worldwide audience. At MP3.com, you'll find some new music from well-known artists as well as a lot more music from artists unsigned by record companies. You'll discover that in many cases, there are darn good reasons why these people haven't been signed to record deals, but you'll also find some real gems. MP3.com has hi-fi and lo-fi versions of most of its music; the lo-fi versions are best for modem users.

Best Place to Track Down Old and Rare Books

Bibliofind (www.bibliofind.com)

It's nice that you can get practically any book in print at any number of online bookstores, from Amazon (www.amazon.com) to Powell's Books (www.powells.com). For those who are looking for a hard-to-find volume, however, Bibliofind has listings of more than 10 million used and rare books at booksellers around the world. Once you find a book in Bibliofind's database, you can buy the book directly from the seller; Bibliofind doesn't take a cut.

cific or obscure. For example, if you want to know everything about "Monster Trucks" or are looking for Web pages that include your name.

Directories Directories, by contrast, aren't built by automated software; people construct them. The biggest and most successful example, Yahoo (www.yahoo.com), maintains a staff that accepts site suggestions from Yahoo users, categorizes the sites, and adds them to the directory. The staff (their official name is the Yahoo Surfers) assigns sites a relevancy score, which is why the most popular sites in a given category show up at the top of a Yahoo listing, with lesser-known or lower-ranked sites listed below it in alphabetical order.

Because people are a lot better at evaluating Web pages than software is, directory-based sites tend to give you not only fewer results but also results that are more relevant to your search. But because people are also slower than indexing software, it can take a long time for a site to get added to a directory, no matter how good it is.

Another important directory is the fast-growing Open Directory Project (www.dmoz.com), which was acquired by America Online when it bought Netscape. Using the slogan "Humans do it better," the Open Directory Project is a Web directory with more than 20,000 volunteer editors, who had categorized more than 1.4 million sites as of January 2000. The remarkable thing about the Open Directory Project, however, is that it's freely available for licensing and use by other search sites, and many commercial services draw on it to supplement their own offerings. If someone adds a site to the Open Directory Project, you'll immediately find it on all the search sites that subscribe to the Open Directory Project.

When to Use a Directory It's often a good idea to start your Net search at a directory such as Yahoo, because most common searches there will get good results. For example, a search on Yahoo for *Charon* turned up several sites about the moon of Pluto, clearly indicated by the category Science > Astronomy > Solar System > Planets > Pluto. This was just what my son needed for his science report. Looking for information about Charon with search engines brought up a bewildering mix of irrelevant things such as companies with that word in their name and sites dedicated to Greek mythology's ferryman of the dead, who also went by that name.

Neither Fish nor Fowl As you might guess, some search sites use a hybrid approach, with spiders backing up humans. Even Yahoo, the granddaddy of the human-based approach, does this now. When you do a search for something that Yahoo can't find in its own directory, your query gets bounced to a search engine from Inktomi, which searches though its spider-built index. Similarly, the search engines at HotBot (www.hotbot.com) and AltaVista are now backed up by the Open Directory Project's database.

Ask a Simple Question The Ask Jeeves site (www.ask.com) combines the directory and search-engine approaches, too, but in a unique, user-friendly way. It allows you to ask questions in plain English, rather than requiring keywords. You simply type in a question such as "Where can I find a cost comparison for mortgages?" and Jeeves returns a choice of answers. (See the screen shot "Just Ask.")

How does it work? The site parses your question and compares it to the millions of questions, compiled by Jeeves staff, already on file. When it finds a match, Jeeves displays the answer to your question. If your question isn't on file, Jeeves performs a keyword search on your question, returning results from several other search sites.

The advantages to using Ask Jeeves are that you can phrase your question the way you would ask it in the real world and that you don't have to learn any search techniques. Plus, it almost always gives you useful results.

Best Place to Find Discussion Boards

Remarq (www.remarq.com)

Net newcomers tend to think the Web *is* the Internet, but that's not so; a huge amount of the data transmitted over the Net is part of a large number of discussion boards called Usenet. There are more than 30,000 of these boards (called newsgroups) on Usenet, and chances are good that your ISP (Internet service provider) doesn't carry the entire newsfeed. That's why you'll want to turn to Remarq, which not only has virtually all of Usenet but also stores it so you can search down discussions about, well, just about anything. Remarq organizes newsgroups into subject areas and puts a friendlier face on Usenet's arcane naming structure, so you don't have to remember the name of the comp.sys.mac.misc newsgroup.

Best Place to Decipher Tech Terms

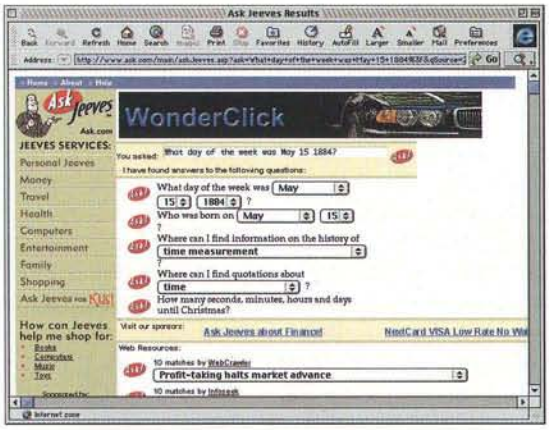
Computer Currents High-Tech Dictionary (www.currents.net/resources /dictionary/inex.html)

Can't tell a GIF from a GIMP or a VAR from a VAD? You're not alone. There are so many acronyms and technical terms to keep track of in the computer field that it's good we have the High-Tech Dictionary to separate the real terms from the technobabble. In addition to a searchable database of tech terms, the site has a list of emoticons (those sideways facial expressions made from keystrokes), HTML tags, file extensions, and Internet domain suffixes. The site can also generate a random term.

Metasearch Sites Another category of search site is the metasearch site. This is a search site that doesn't do its own Web indexing but instead searches other search sites. Most metasearch sites take your search term and submit it to several search engines, eliminating duplicate results; a good example of this kind of site is Go2Net (previously known as MetaCrawler), at www.go2net.com.

There are also metasearch utilities, such as Apple's own Sherlock, which can do smart searches of multiple sites (see "Sherlock Power Searching," *Secrets*, March 1999, for more tips about using Sherlock). Metasearching is useful because it winnows out a lot of the repeated hits you get from some search engines. But results are at the mercy of the accuracy of the individual sites in the metasearch. Following the ancient computing law "garbage in, garbage out," a metasearch site is only as good as its component sites.

All-in-One Sites Instead of going to a lot of sites, why not just build a site that lists other sites and lets you pick which one to search? If a search turns out to be not useful, another site is as close as your browser's Back button. That's the idea behind all-in-one search sites. One of my favorites is Search It All (www.search-it-all.com), which gives you a single query box that lets you search from any of 23 other search sites. The site also has specialized areas, such as Biomedical, Government, Reference, and Sports, for more specific searches, and each area gives you several information sources to choose from.



Just Ask Ask Jeeves (www.ask.com) lets you ask questions in plain English instead of making you learn special search terms.

Find What You Want

For most of your searches, you'll probably start with a directory or Ask Jeeves. There are going to be times, however, when you can't beat a search engine. To zero in on the information you really want, you'll need to learn how to talk the language that search engines use.

Let's say that you've just bought a new Power Mac G4 and you want to add a second monitor and a fast video card to it. A search for *G4 multiple monitors* on AltaVista produces 1,940 results—more than you can comfortably look through. But a search for *G4 "multiple monitors"*—using quotation marks to group the last two words—trims the results list to 125, and adding *voodoo3* (the name of a video card) narrows the results to a manageable 34 sites.

Power-Searching with AltaVista AltaVista is an amazingly powerful search engine *if* you know all of its little shortcuts and helpers. In case, like most of us, you don't, here are some ways to make your searching more efficient.

You'll want to learn AltaVista's methods for two reasons: first, it's one of the largest and most popular search engines, and second, AltaVista has been around longer than many of the other search engines, and lots of them have adopted AltaVista's way of doing things. (Check the More Information or Advanced Search sections of other sites for their unique features.) Except when noted, you can employ all these search tips from the main AltaVista page, rather than from the Advanced Search page.

Where Will You Search? Below the search field on AltaVista's opening page, you'll see the Find Results On choices. Here, AltaVista lets you choose where to search: The Web, News, Discussion Groups, or Products. Selecting News limits your search to current news stories, whereas selecting Products instructs AltaVista to search shopping sites.

Specify Your Native Tongue One way to cut down on the number of irrelevant pages your search returns is to specify what language you speak. Chances are, you're only interested in Web pages in a single language. Why wade through hundreds

Best Place to Look for a Job

Monster.com (www.monster.com)

Tired of your job? Looking for a new one but don't have the time to pound the pavement or scan through the Sunday paper? Monster.com may just have your new job waiting for you. You can use the site by browsing the job listings, sorted (of course) by geography, category, and keywords. Or if you're ready to make the jump to "e-lancing," you can list yourself in an auction where employers bid for your skills. The site also includes job-hunting resources; lets you store your résumé online; and has thousands of company profiles, so you can check out a potential employer before you apply.

Best Place to Find Movie and TV Info

The Internet Movie Database (www.imdb.com)

The ultimate resource for settling bar bets about virtually any movie or television program, IMDb (now owned by Amazon.com) has listings of titles, people (actors, actresses, and crew), characters, plots, and famous quotes. You'll also find their lists of the top films of all time (as well as the worst!) and Academy Award winners. You can even discover which entertainers share your birthday. My favorite IMDb features are the listings of trivia and goofs associated with individual movies. If you've ever wondered about the significance of oranges in the *Godfather* movies or thought you saw a mistake in *Terminator 2*, you can get the facts here.

In recent months, the site has transformed from a directory of film and TV information into an entertainment portal with discussion boards, local movie times, and enter-

of sites in Romanian? You can cut back the number of results dramatically if you use the pop-up menu to specify your preferred language.

Use the Right Case When you search with all lowercase keywords, AltaVista searches for all forms of the word. Once you use a capital letter, AltaVista will return only results that have the same capitalization format. For example, when I searched for information about JavaScript, searching for *javascript* returned 1,292,770 pages, *Javascript* returned 280,480 pages, *JavaScript* returned 757,925 pages, and *JAVASCRIPT* returned 12,740 pages.

Wild Cards AltaVista allows you to use wild cards—partial words—in your searches by adding an asterisk to your words. Searching for *auto** returns all pages with words that include *auto* (for example, *automobile*, *automotive*, and *automatic*). Use wild cards to easily capture the singular and plural forms of your keywords.

Be Precise If you want to learn all about your favorite breed of dog, you might assume you can simply type *Labrador retrievers* in the AltaVista search field. Not so fast: all you've asked the search engine to do is find all pages that include either of those words. That means you'll get results that include pages on Labrador (the Canadian region) and pages on golden retrievers, as well as a few pages about Labrador retrievers. If you don't want to spend time scrolling through search results that are off the mark, you need to be more precise.

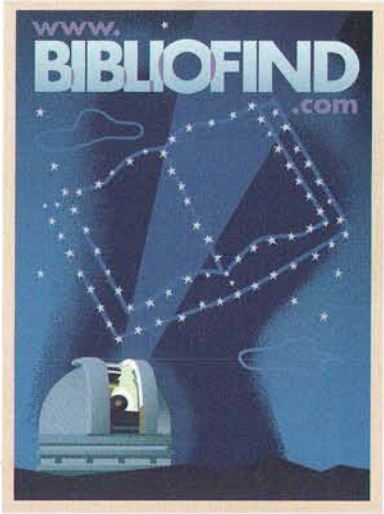
To find *only* pages that contain the exact phrase *Labrador retrievers*, put quotes around the phrase (like so: "*Labrador retrievers*"). However, if you want to know about taking your pet to a dog show, you probably won't have luck searching for "*Labrador retriever dog show*" unless you happen to find a page that has exactly those four words in that order. And if you search for "*Labrador retriever*" "*dog show*", you'll get all the dog-show pages and all the Labrador retriever pages, not just the ones about showing your breed.

You need to be able to tell the search engine that you want to find only pages that contain both the phrases *Labrador retriever* and *dog show*. For that, you'll need to move beyond typing simple phrases and begin adding powerful symbols and commands to your searches.

To tell AltaVista that each phrase must be on the pages it returns, add a plus sign—which signifies that the item following it must appear—before each phrase. Searching for +"*Labrador retriever*" +"*dog show*" requires that the pages contain both phrases. And as you'd expect, adding a minus sign before a word or phrase means that a returned page cannot contain that topic. That lets you narrow your search request—so +"*Labrador retriever*" +"*dog show*" -*California* would exclude shows held in the Golden State.

Try an Advanced Search

You may still get too many results, even when you've narrowed things down with the above techniques. When you need a more precise search, you can click on the Advanced Search tab on AltaVista's main page. The Advanced Search option doesn't allow you to use pluses and minuses to specify whether to include or exclude pages. Instead, you need to use *Boolean* logic—a mixture of keywords separated by ANDs, ORs, and NOTs—which gives much more specific results.



Let's say that you're searching for a review of the latest G4 Macs, trying to figure out which one to buy. You could go to AltaVista's main search bar and enter *+G4 +review*, but that search results in reviews of lots of strange things (such as a page on cell aging), all of which have *G4* in their names. But if you search for *+G4 +review +"power mac"*, you'll miss all the pages that refer to the machine just as a Mac or Macintosh. It's time to try a Boolean search.

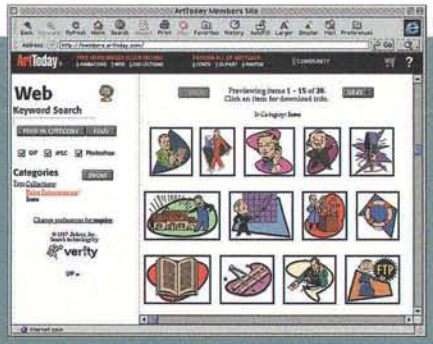
A regular search doesn't let you search for options where any one of a list of items must be true. But a Boolean search

tainment news. IMDb accepts some reader submissions, so if you know something about a movie that's not already in the database, you can add it (they'll check what you tell them, of course).

Best Site for Finding Web Graphics

Art Today (www.arttoday.com)

Looking for graphics for your Web site? Want a snappy look but aren't so hot with Photoshop? Look no further than Art Today, which has 150GB of images available for paid members to download (membership starts at



$29.95 per year and goes up to $99.95 per year). But a free membership still gives you access to over 40,000 Web graphics. The free images include buttons, icons, backgrounds, and other useful graphics. When you cough up some cash, you get access to clip art, photographs, and fonts.

Best Way to Find Web Logs

Eatonweb Blog Portal (www.eatonweb.com/portal/)

Not yet familiar with the term *Web log*? You soon will be. Web logs are personal Web sites operated by people who make lists of links to stuff that interests them, usually adding their own personal spin. A Web log (or weblog—sometimes shortened to *blog*) can range from simple pointers to other sites, to deeply personal online diaries, to random thoughts and jokes. There are now hundreds of these Web logs, and Web loggers become guides to the information that interests them.

lets you use the command OR to do just that. On the advanced-search page, therefore, you could search for *G4 AND review AND ("power mac" OR mac*)*. You need to put your OR possibilities within parentheses so the search engine knows where the list begins and ends. Also, note that on the Advanced Search page, you use the command AND instead of the plus sign.

If you want to narrow the search down further, you can use the AND NOT option, which works like the minus sign in a regular search. For example, if you want to skip all results from www.apple.com because you know their opinion about the G4 already, your search would be *G4 AND review AND ("power mac" OR mac*) AND NOT host:apple.com*. (What's that funky *host: apple.com* thing we just did? See the table, "8 Ways to Find Things Faster," for these special commands.)

The Last Word

Automated searching has come a long way in the last couple of years, but the best software still can't match a human editor when it comes to finding relevant results. That's why your first stop when looking for information on the Web should usually be a directory, such as Yahoo or the Open Directory Project. Ask Jeeves's plain-English queries also deserve special mention, because the site is very easy to use and nearly always gives useful results.

If you're looking for a very specific topic, you'll want to use one of the keyword-based search engines. AltaVista and Google, although they work in vastly different ways, both excel at providing relevant results. Google in particular does a great job of sparing you most of the junk sites.

Finding information on the World Wide Web is still far from a perfect process, but with your newfound knowledge and a little persistence, there's no doubt that your search will be a success. **m**

Contributing Editor TOM NEGRINO's latest book is *Quicken 2000 for Macintosh, Visual QuickStart Guide* (Peachpit Press, 1999). Negrino's Web log can be found at www.backupbrain.com.

8 WAYS TO FIND THINGS FASTER

AltaVista has a variety of search attributes you can use to make your searches even more precise. To use one, go to Altavista's Advanced Search page and type it in the search field, followed by a colon and the text you want to require or disallow. These search attributes let you zoom in on images, links, or portions of Web pages.

Search Attribute	What It Does	How It Can Help You
anchor:	Finds pages that contain the specified word or phrase in the text of a hyperlink. Searching for *anchor:"Click here to make money fast!"* would bring you pages with the words *Click here to make money fast!* as links.	This search attribute lets you find links with particular wording.
domain:	Finds pages within a particular top-level domain or two-letter country code. Use *domain:gov* to find pages from government sites or *domain:uk* to find pages on British sites	This is particularly helpful if you're trying to find information on an official site. For example, you might want to see what the Justice Department itself has to say about Microsoft.
host:	Searches just the host-name portions of URLs. For example, *host:apple.com* would find pages on Apple's Web site, and adding *-host:geocities.com* to your search would keep pages with annoying pop-up windows out of your results.	With this search attribute, you can narrow your search to just a single host but still get all the sites under that host. For example, you would get pages at info.apple.com as well as www.apple.com.
image:	Finds pages with images that have a specific file name. Use *image:pikachu* to find all the pages with an image named *pikachu*.	This will save you a lot of time if you want to see something instead of just read about it.
link:	Finds pages with a link to another page with the specified URL text. You can use *link:www.yoursite.com* to find all the Web pages that link to your site.	This search attribute lets you find out how popular a site is. One indicator of a site's popularity is the number of other sites that link to it. If you're a Webmaster, this search lets you find out which sites have linked to yours.
text:	Finds pages that contain the specified text, excluding image tags, links, or URLs.	This is much the same as a regular Web search; it's not used very often.
title:	Finds pages that contain the specified word or phrase in their titles. Searching for *title:"welcome to adobe golive"* gives you all the Web pages of GoLive users who couldn't figure out how to turn off the program's default title (there are more than 30,000 Web pages with this title out there, at last count).	Since the title of a page usually refers to the topic or the most important information of a page, this search attribute helps you find relevant results and cut down on the number of hits.
url:	Finds pages with a specific word or phrase in the URL. Use *url:macintosh* to find all pages on all servers that have the word *macintosh* anywhere in the URL.	This search attribute lets you do broad searches for terms in URLs.

You think the Internet is safe. Think again...

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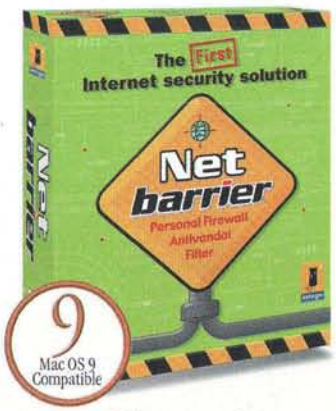

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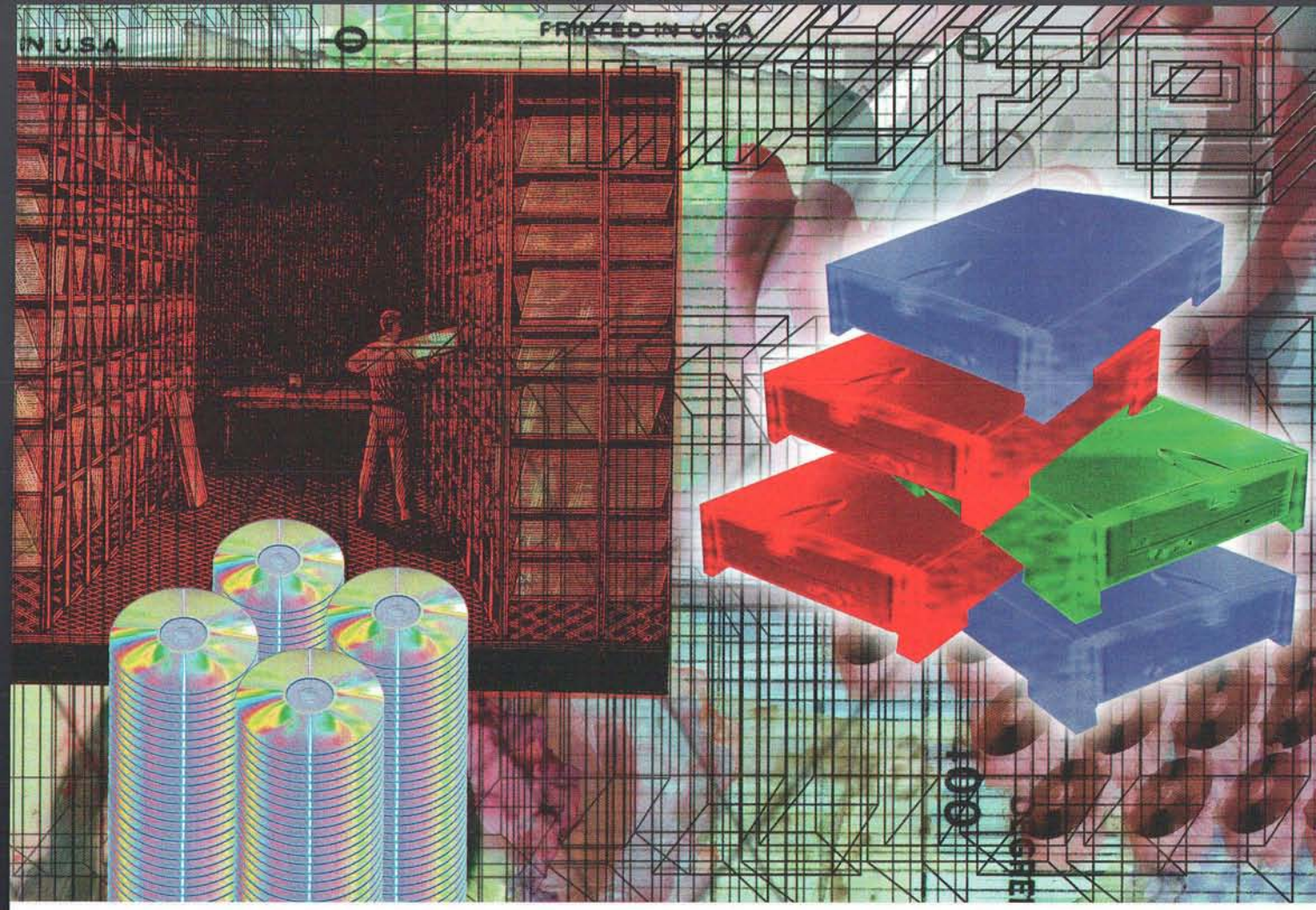


Hold Everything

NEW DVD-RAM DRIVES OFFER MORE STORAGE FOR LESS MONEY

by Kelly Lunsford

ILLUSTRATION BY JORDAN CRANE

YOUR MAC'S HARD DRIVE MAY BE A REGULAR behemoth compared to what you had even a few years ago, but then again, your files have gotten bigger too. Your archive of Adobe Photoshop projects, video from your DV camcorder, and your collection of favorite MP3s can eat up gigabytes of space, creating hardships for even the most monstrous of drives.

Until recently, if you wanted to back up large amounts of data—or if you needed an easy way to transfer very big files (to a service bureau for printing, for example)—your only options were technologies such as tape, Iomega's Jaz, CD-Recordable (CD-R), or CD-Rewritable (CD-RW) drives.

Macworld LAB TEST

But times are changing, and there's a new way to store your data that could one day make those old standbys seem as outdated as polyester leisure suits.

Meet DVD-RAM, a rewritable DVD format. A DVD-RAM disc holds more data than a 2GB Jaz cartridge, and the hardware is easier to use than CD-R and CD-RW drives. DVD-RAM products have crept into the market in recent months (see the sidebar, "Here to Stay?"), and Macworld Lab tested six of the newest

DVD-RAM drives to see if this technology is really an affordable and fast answer to your storage woes.

The Basics

What DVD-RAM *isn't* is as important as what it is. DVD-RAM stands for Digital Versatile Disc Random Access Memory. The name refers to the RAM-like way a DVD-RAM drive saves your data onto discs, but *true* RAM lives in your computer and parcels out memory to Microsoft Word, Photoshop, and other programs.

And a DVD-RAM disc isn't the kind of DVD you can rent from your neighborhood video store and watch in your new set-top DVD player or on your iMac DV. DVD-Video, which holds movies, has received a lot of attention lately because of its supreme durability and capacity, but because DVD-Video is read-only, there's no way to harness this power for your storage needs. That's where DVD-RAM enters the picture. DVD-RAM is the first recordable and rewritable DVD format to hit the consumer market.

Director's Chair Keep in mind that just as DVD-RAM isn't DVD-Video, it can't be used to create DVD-Video. This means you can't use your new DVD-RAM drive to start the mass production of your own home-movie discs. The DVDs you use to watch movies must contain data compressed in a format called MPEG-2, which organizes and optimizes video files for playback. (This compression process requires special hardware and software that can cost more than $10,000 and that are not currently compatible with DVD-RAM.) For the moment, DVD-RAM has one talent: storing information—lots and lots of it.

DVD-What? Despite its confusing name, the technology behind DVD-RAM is fairly straightforward. In fact, if you've been using a CD-R or CD-RW drive to burn backup discs or make your own music CDs, you won't find the mechanics of DVD-RAM that foreign.

Both types of drive use a high-power laser to burn data, in the form of 1s and 0s, onto spinning discs. DVD-RAM media look different from CDs—they are encased in a protective plastic cartridge, similar to those used in older CD-ROM drives before tray-loading models appeared. Despite this difference, the discs themselves are the same size as CDs.

The Big Deal On top of DVD-RAM discs' greater storage capacity, the drives can copy files using the Finder and change and delete individual files without rewriting an entire disc.

And if that isn't enough to grab your attention, consider this: Apple sees enough potential in the technology that it has replaced the DVD-ROM drives on its high-end G4s with DVD-RAM drives.

Packin' It In When it comes to storage devices, size definitely matters. By using a narrower laser to record data, DVD-RAM drives are able to store significantly more data than CD-RW drives, packing as much as 2.6GB onto a single-sided disc. A typical CD can hold 650MB, and the highest-capacity discs can squeeze in only 700MB. What's more, you can flip some DVD-RAM discs over and record on both sides, bringing the final tally up to a whopping 5.2GB per double-sided disc. In case you don't have your calculator handy, that's the equivalent of 8 CDs or just about 21 250MB Zip disks. (2.6GB DVD-RAM discs cost about $30, and 5.2GB discs cost about $50, compared with close to $15 for a 250MB Zip disk and around $100 for a 2GB Jaz disk.)

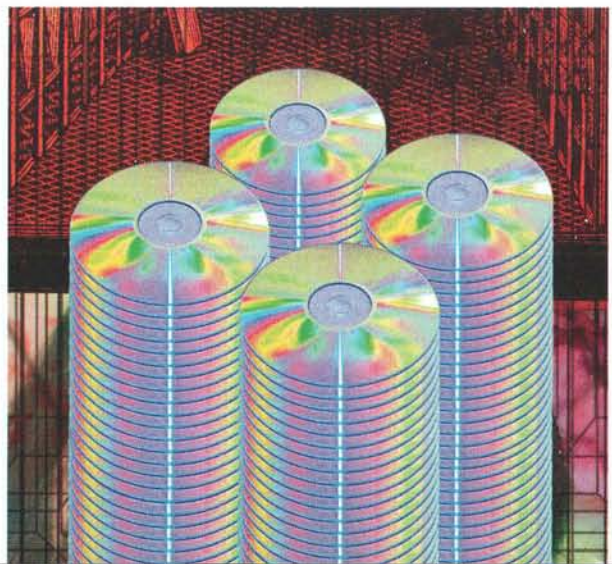
Around and Around The DVD-RAM format also stores data much more efficiently than its rewritable CD counterpart. CD-RW drives write data in a continuous spiral, which means the drive has to start from the beginning and rewrite the *entire* disc each time you put something new on it. That's a lot of unnecessary work if you simply want to delete or add a few JPEG image files from your vacation or back up some Word files. DVD-RAM drives, on the other hand, allow you to write new information to a disc just as you would to your hard drive. They're able to do this because the discs are segmented into 2K blocks, called *sectors*, that serve as markers between chunks of data. Using these markers, a drive can quickly skip to sections of the disc that need to be altered and write over the information in those blocks without disturbing the rest of the disc.

And because a DVD-RAM volume appears on your desktop, like a Jaz or Zip disk does, transferring items is as simple as dragging and dropping them onto the disc icon. CD-R and CD-RW drives require special software such as Adaptec's (800/442-7274, www.adaptec.com) DirectCD, which is bundled with most drives and which allows Finder copies but creates only UDF (Universal Disc Format, a newer cross-platform standard) discs. Otherwise, you must use a program such as Adaptec's Toast (also bundled with drives or available separately as Toast 4 Deluxe for $99) to record data onto a disc.

The Goods

If you plan to buy a new G4, you might want to let Apple take care of the DVD-RAM–selection process for you. The drives are standard on the high-end Power Mac G4/500 and are available as a $300 option on other G4 Macs. We got subpar performance with Apple's driver, but the drive is very compatible and Apple DVD Player allows you to play DVD movies with it. If you already have your Mac, however, you can choose between an internal and external version.

Making a Connection Of the six drives we tested, five were external devices that use a SCSI-2 connection to hook up to the Mac. The exception was the $495 ProMax Systems Internal DVD-RAM drive. New Macs do not have a SCSI port, so unless you have an older Mac, you'll have to buy and install—if you haven't already—a SCSI card to use these drives. The $549 QPS Que DVD-RAM drive comes with a SCSI card for an extra $30. (For information on buying and installing SCSI cards, see "Generation Gap," August 1999.) For those who own a new iMac or who find the idea of opening up a computer and fiddling with its



guts a nerve-wracking proposition, FireWire DVD-RAM drives should be shipping by the time you read this.

As with any external device, using a SCSI DVD-RAM drive requires a little extra work. You'll need to make sure your drive talks to your computer correctly. Apple's DVD driver, which tells your Mac how to interact with DVD devices such as DVD-RAM drives, works only with an *internal* IDE DVD drive—the only one it can see. To compensate, companies are bundling their external drives with Software Architects' (425/487-0122, www.softarch.com) $100 DVD-RAM TuneUp software. In addition to providing the necessary drivers, this software lets you format DVD-RAM media in both HFS (Hierarchical File System) and HFS+, the standard Mac disc formats, as well as in UDF. The shipping version of TuneUp currently supports only OS 8.6, but a free OS 9 upgrade was released just prior to press time. You can download it from Software Architects' Web site.

Here to Stay?

As anyone who owned a Betamax VCR can tell you, it doesn't always pay to be first on a new technology's bandwagon. Hot new products can easily become obsolete.

Until recently, it looked as though DVD-RAM might suffer a similar fate. Although DVD-RAM drives for the Mac have been available for more than a year, a war over recordable-DVD standards kept many potential customers at a cautious distance while manufacturers divided themselves up among four different, incompatible formats: DVD-R; DVD-RW; and the two main consumer rewritable options, DVD+RW and DVD-RAM. While Panasonic, Hitachi, and Toshiba united behind the 2.6GB DVD-RAM standard, Sony and Hewlett-Packard put their considerable weight behind the long-awaited DVD+RW format with the promise that the first drives would hold 3GB.

All that changed in November, when HP and Sony announced they were abandoning their original plans for the 3GB drives and would instead focus on delivering a 4.7GB DVD+RW drive in 2001. With a shipping DVD+RW product still more than a year away, customers finally stopped waiting and started buying DVD-RAM products.

And with Apple now adding its support for the DVD-RAM format, the future looks bright for the once troubled drives. In fact, it looks like the DVD+RW backers will miss the train once again. Panasonic and Hitachi are already shipping a 4.7GB DVD-RAM mechanism to manufacturers, and these drives may appear on shelves as early as the middle of this year.

The Test's the Thing

If you're in the market for a removable-media drive, there is more at issue than just capacity—speed and compatibility are at least as important. When you're rushing to get your last-minute design project to the printer, waiting for a slow drive to copy the files onto a disc can be annoying. And if your service bureau can't read the disc, you have the makings of a first-class headache.

Macworld Lab tested six DVD-RAM drives for speed and compatibility. (See the benchmark, "Speeding Along," for test results.) Despite their various product names, all of the drives contained mechanisms by one of two companies—Hitachi and Matsushita, parent of Panasonic. (For details and ratings, see the table, "6 DVD-RAM Drives Compared.") To get an of idea how these drives compare with other types of removable-media devices, we also tested Iomega's Jaz 2GB drive and Yamaha's 4×2×6 CD-RW drive (using Adaptec's Toast 4 Deluxe).

The Need for Speed There are two main ways to transfer files onto a DVD-RAM disc. You can use the Finder to drag and drop selected files onto the drive icon, just as you would with a Jaz or Zip drive. But if you're planning to use the drive for

Macworld LAB TEST

Speeding Along

When it comes to backing up data, speed is nearly as important as capacity. All the DVD-RAM drives we tested can record the same amount of data, but some record faster than others. Our Editors' Choice pick displays performance similar to that of another drive, but its price tag is smaller.

Best results in red. *Reference systems in italics.* All results are in seconds.

	Mechanism	MAC OS 8.6 FINDER: Copy 20MB File (HFS)	MAC OS 8.6 FINDER: Copy 20MB File (UDF)	RETROSPECT 4.2: Backup 424MB of Data
★ APS Tech DVD-RAM External SCSI	Matsushita PD-2 LFD100	49.8	42.3	303.8
LaCie K525 Case DVD-RAM	Matsushita PD-2 LFD100	49.9	42.5	303.3
ProMax Systems Internal DVD-RAM	Matsushita APD-2 LFD110	52.2	44.3	673.2
EzQuest Boa DVD-RAM *	Hitachi GF-1050	99.6	93.6	967.5
Pinnacle Micro Flex Drive	Hitachi GF-1050	82.6	39.0	307.3
QPS Que DVD-RAM	Hitachi GF-1050	87.6	40.2	309.7
Iomega Jaz 2GB	*Jaz 2GB*	*14.3*	*NA***	*184.7*
Yamaha 4x2x6 CD-RW (CD-R mode)	*Yamaha 4260*	*95.4*	*NA***	*412.7*

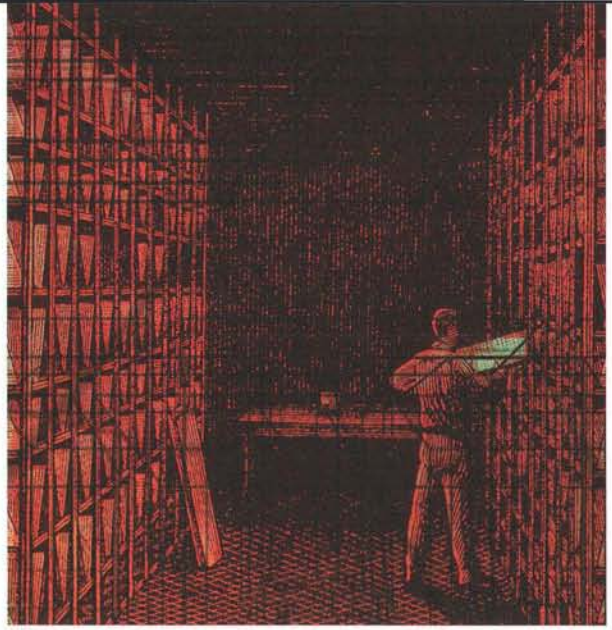
★ = EDITORS' CHOICE

Shorter bars are better.

**Speeds were slower due to disabled write cache, which company promises to fix. **Not applicable; the UDF format is generally used only with DVD media.*

Behind Our Tests

We tested all drives using a Power Macintosh G3/400 with Mac OS 8.6, 128MB of RAM, a 2MB system disk cache, and virtual memory disabled. For file-transfer tests, we copied a 20MB Adobe Photoshop file using the Finder. (We used Toast 4 Deluxe with the Yamaha CD-RW drive.)—**Macworld Lab testing supervised by Gil Loyola**



backup, you'll probably also use Dantz Development's (800/225-4880, www.dantz.com) Retrospect, which optimizes and facilitates this process by bypassing the Finder altogether. We compared speeds for both types of file transfer: using the Finder to copy a 20MB Photoshop file and using Retrospect 4.2 for a 424MB data backup.

Retrospective Four of the drives—APS Tech's $500 APS DVD-RAM External SCSI, LaCie's $579 K525 Case DVD-RAM, Pinnacle Micro's $649 Flex Drive, and QPS's Que DVD-RAM—hustled at around 1.4MB per second when backing up with Retrospect, due to the program's advanced optimization tools. Of the four, the LaCie and APS Tech drives were the fastest, beating out the Pinnacle Micro and QPS drives by mere seconds. Although Iomega's Jaz drive stole the show, copying files at 2.3MB per second, these four DVD-RAM drives were on average 25 percent faster than Yamaha's CD-RW drive, which was writing in 4× CD-R mode.

Although based on the same Hitachi mechanism as the Pinnacle Micro and QPS drives, the $579 EZQuest Boa DVD-RAM drive transferred files very sluggishly. In fact, it required a full 16 minutes to back up the files that the other drives handled in only 5 minutes. The problem was that the Boa's write cache was disabled, preventing the drive from using its 1MB data buffer and thus slowing down performance. EZQuest is aware of the problem and plans to correct it on new drives.

ProMax's drive, the one internal ATAPI drive in our tests, also lagged considerably when backing up data with Retrospect. The drive took more than twice as long as drives with similar mechanisms to complete a large backup (copying at roughly 0.6MB per second). The culprit is Apple's driver—not the drive. The numbers improved when we switched to the drivers included on Software Architects' TuneUp CD.

Lost and Found If you don't have a backup program such as Retrospect or if you need to transfer only a few files at a time, you can use the Finder to copy files onto your DVD-RAM drive. There is, however, a serious drawback to using the Finder. The performance of each DVD-RAM drive took a significant hit when we used the Finder to copy a 20MB Photoshop file. In fact, speeds slowed to less than half those of the Retrospect transfers. This is because the Mac OS copies files in 512K blocks instead of the 2K blocks into which DVD-RAM media is formatted, forcing the drive to slow down while the large packets of data are broken into 2K blocks.

Neck and Neck? The APS Tech, LaCie, and ProMax drives, all based on Matsushita hardware, produced virtually identical results in the Finder-based HFS and UDF copy tests. The drives copied the files at around 0.5MB per second. Even with the drop in speed, the Matsushita-based drives were still about 50 percent faster than Yamaha's CD-RW drive, which transferred the data at a paltry 0.2MB per second.

Results were considerably less consistent with the Hitachi-based DVD-RAM drives. When copying 20MB files in UDF format, the Pinnacle Micro and QPS drives outperformed all three Matsushita-based drives by a few seconds. But when copying the same file using HFS, the Pinnacle Micro and QPS drives suffered a huge loss of performance. Both drives took more than twice as long to copy the same Photoshop file in HFS as in UDF. EZQuest's drive was once again the slowest, placing last in both tests.

Playing Nice

If you work in a small office space or have to keep up with several projects at once, you know that hard drives aren't the only things

6 DVD-RAM Drives Compared

Company	Product	Mouse Rating	List Price	Contact	Mechanism	Data-Buffer Size
APS Tech	EDITORS' CHOICE APS DVD-RAM External SCSI	♦♦♦♦	$500	800/395-5871 www.apstech.com	Matsushita PD-2 LFD100	2MB
EZQuest	Boa DVD-RAM	♦♦½	$579	714/694-0031 www.ezq.com	Hitachi GF-1050	1MB
LaCie	K525 Case DVD-RAM	♦♦♦½	$579	503/844-4500 www.lacie.com	Matsushita PD-2 LFD100	2MB
Pinnacle Micro	Flex Drive	♦♦♦	$649	800/553-7070 www.pinnaclemicro.com	Hitachi GF-1050	1MB
ProMax Systems	ProMax Internal DVD-RAM	♦♦♦½	$495	800/977-6629 www.promax.com	Matsushita APD-2 LFD110	2MB
QPS	Que DVD-RAM	♦♦♦	$549	800/559-4777 www.qps-inc.com	Hitachi GF-1050	1MB

without enough space. The last thing you need is yet another drive sitting around taking up valuable desktop real estate.

If an extra piece of hardware in your already crowded cubicle means the difference between having a place to set your morning bagel and eating off your lap, you will appreciate a DVD-RAM drive's flexibility as an all-in-one optical-media drive. Although they can't write to CD-R or CD-RW discs, the drives can play CD, CD-ROM, CD-R, CD-RW, and DVD-ROM media.

You Can Take It with You You should be able to read most discs that are sent your way, but unless your colleagues have DVD-RAM drives of their own, you'll probably run into trouble when it comes to sharing your files with the rest of the world. DVD-RAM discs will not play in CD-ROM, CD-R, and CD-RW drives. You can, however, play some DVD-RAM discs in many DVD-ROM drives.

DVD-RAM media come in two flavors: Type I and Type II discs. Type I discs, which are all single-sided, and double-sided Type II discs cannot be removed from their protective cartridges. But single-sided Type II DVD-RAM discs can be removed from their cases and played in third-generation or later DVD-ROM drives. So if your colleagues own iMac DVs, blue-and-white G3s, G4s, 2000 model PowerBooks, or recently purchased DVD-ROM drives, they shouldn't have any problems playing single-sided Type II DVD-RAM discs in their DVD-ROM drives. If you work in a cross-platform environment, your chances for compatibility are less promising. Because DVD-ROM drives have been a PC staple for longer, more older—and incompatible—drives are out there.

Home Movies Watching DVD movies on your external DVD-RAM drive is another tricky proposition. DVD playback requires special hardware and software that decode the MPEG-2 data on DVD-Video discs. Theoretically, if you use a computer such as a G4 that already supports DVD playback, you *should* be able to use those same drivers with your external DVD-RAM drive. Unfortunately, this isn't the case. Because Apple DVD Player will read only from the machine's first internal IDE drive, the DVD drivers will not recognize SCSI devices. As a result, external drives require additional decoders such as Wired's (408/855-9350, www.wiredinc.com) $219 Wired 4DVD MPEG-2 card, which comes bundled with the APS drive for an additional $190. But the software isn't up to the challenge of DVD-RAM just yet—none of our attempts to play movies on external DVD-RAM drives with the MPEG-2 card were successful. Even on a computer with built-in hardware, Wired's player produced the same lack of results.

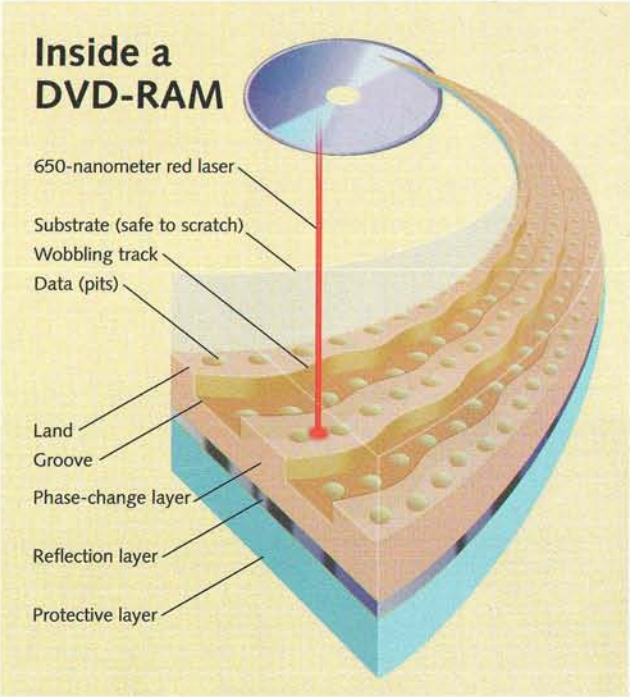


ILLUSTRATION BY ARNE HURTY

Macworld's Buying Advice

DVD-RAM is by no means the fastest removable-media technology on the block. But if you need lots of removable storage or want to back up your data onto durable and relatively inexpensive media, a DVD-RAM drive could be a wise investment. Of the Matsushita devices we tested, APS Tech's DVD-RAM drive and LaCie's K525 Case DVD-RAM drive performed almost identically across the board. APS Tech's drive is $79 less than LaCie's and is therefore our Editors' Choice.

If the ability to continue playing movies on your DVD-equipped Mac is more important to you than really speedy backups, a better choice may be replacing your DVD-ROM drive with an internal DVD-RAM drive, such as ProMax's Internal DVD-RAM drive. This is the only surefire third-party option if you hope to watch DVD movies on your computer via your DVD-RAM drive.

Many of the inconsistencies and problems we found during our testing serve as reminders that DVD-RAM is still very much a new technology—but one you will undoubtedly be hearing more about in the next year. Evolution will eventually have its way with the old, incompatible DVD-ROM drives—making file sharing less of an issue—and new software will fill in some of the gaps currently marring DVD-RAM's reputation. m

Assistant Editor KELLY LUNSFORD covers graphics software, networking products—and now DVD-RAM technology.

Interface	Comments
SCSI-2	Good overall performance; available with Wired 4DVD MPEG-2 card for $690.
SCSI-2	Very slow due to a problem with write cache; company is fixing this glitch.
SCSI-2	Good overall performance.
SCSI-2	Slow when formatting in HFS.
Internal ATAPI	The only drive able to play DVD-Video; slow with Retrospect.
SCSI-2	Slow when formatting in HFS.

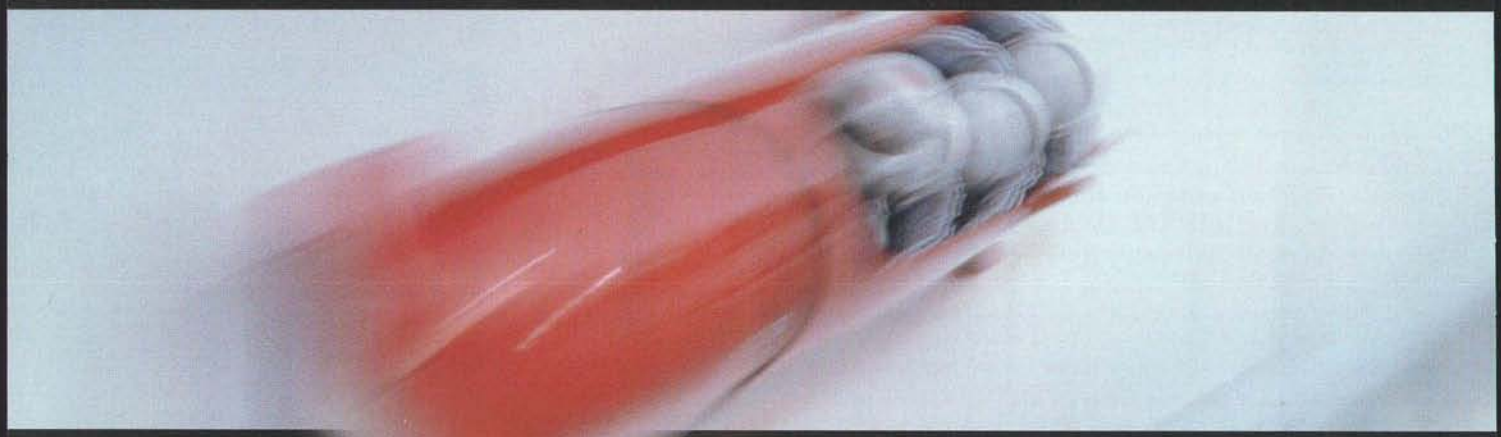
EDITORS' CHOICE

APS DVD-RAM External SCSI

This drive has a large data buffer and good overall quality, and it's priced $79 less than LaCie's nearly identical drive.

REAL PRODUCTS REAL RATINGS

Company: APS Tech (800/395-5871, www.apstech.com). **List price:** $500.



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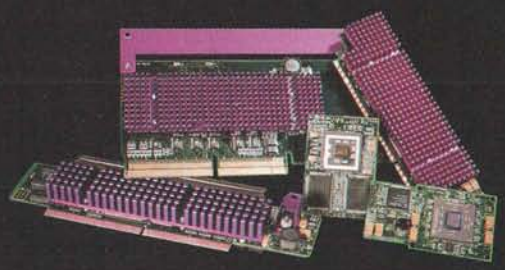

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Secrets

Voice-Protect Your Mac

TO PASSWORD-PROTECT YOUR MAC, JUST SAY THE WORDS

by Ted Landau

You start up your Mac, and it prompts you to speak to it before it will let you access anything on your hard drive. Taking a cue from *The Matrix*, you reply, "There is no spoon." The Mac recognizes the unique characteristics of your voice and lets you log in. This is no science-fiction scenario—you can do this today with Mac OS 9.

The Multiple Users control panel, new to OS 9, lets you create spoken passwords with a feature called Voiceprint. Overall, Apple has done a great job of making Voiceprint verification reliable and easy to use. Still, there are a few things that can go wrong. (To learn the basics of using this new password system, see "Setting Up Voiceprint.")

OTTO STEININGER

Know What to Say

Don't make your Voiceprint phrase too short or your Mac may have trouble recognizing it. In fact, if you get a message that says you spoke too softly, a short password could be the real problem.

Also, make sure you don't use your typed password as your spoken phrase, unless you want everyone in hearing distance to be able to access your hard drive.

Know When to Stop

Stop talking *before* you hit the Stop button when you're through recording. Otherwise, you're likely to get an error message that says you've clicked on the Stop button too soon. You may also get this message if there's too much extraneous noise when you click on the Stop button. In both cases, the software assumes you weren't done entering your phrase.

If you're using one of the new fanless iMacs and get this error, Apple says it may be caused by the noise of the iMac's hard drive. Apparently, if you had a fan it would mask the noise. There isn't much you can do except try again and keep extraneous noise to a minimum.

"Lost" Microphone

If you get a "No microphone found" error message at log-in even though you have a microphone plugged into your Mac, it may be that you don't have a compatible version of Apple's Speech Recognition software installed. You need version 2.0.1 (which comes with Mac OS 9) or a newer version for Voiceprint passwords to work. To check the version number, open the Get Info window of the Speech Recognition extension.

Switching microphones can also lead to trouble. If the microphone you're using now is different from the one you used to record your Voiceprint phrase, you may get the "No microphone found" error. The fix is simple: rerecord your Voiceprint phrase using the current microphone.

continues

Dealing with Rejection

If you ever change your password in the File Sharing control panel, you'll have to change your password in the Multiple Users control panel to match it—or else Voiceprint won't work. If you change your name in the File Sharing control panel, you'll have to start from scratch and rerecord your Voiceprint phrase.

Altering the tone of your voice or changing the syllables you emphasize can prevent the software from making a match at log-in. If your Mac fails to recognize your phrase, try to repeat it exactly the way you recorded it. If this still doesn't work, don't panic: after three rejections, your Mac will prompt you to enter your typed password instead. Yup, your typed password works, even with Voiceprint enabled. Comforting to know in case you ever get laryngitis.

Changing of the Guard

Voiceprint is the flashiest component of Multiple Users' beefed-up security. In fact, with the arrival of Mac OS 9, you have more protection options than with any previous Mac OS. However, the arrival of Mac OS 9 also means bidding adieu to a couple of older security features.

An indication of missing features is the dimmed-out Protect System Folder and Protect Applications Folder items in the General Controls control panel. You can't select them, which is Apple's not-so-subtle way of saying that you should now use the Multiple Users control panel to obtain this protection.

If you find that the At Ease software is missing, this is no mistake. Once the Multiple Users control panel is installed in your System Folder, even if it's not turned on, the Mac OS trashes At Ease.

This might all be fine if the Multiple Users feature were capable of the heavyweight security often needed in schools and other public places. But it isn't. It's easy to get past Multiple Users' protection simply by starting up from a bootable CD, such as any Mac OS system-software CD. (To learn about other ways that Multiple Users is vulnerable to security breaches, see "Top Secret OS 9," March 2000.) If Multiple Users isn't adequate for your security needs, turn to AppleShare IP or Mac OS X Server. ■

TED LANDAU covers the latest Mac OS 9 tips and fixes on his MacFixIt Web site (www.macfixit.com). No password needed.

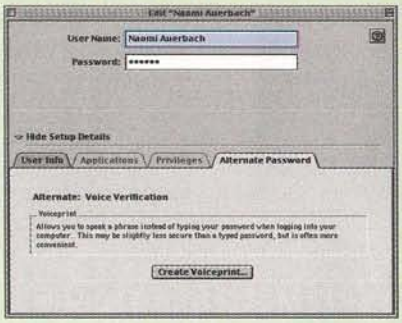
Setting Up Voiceprint

FINDING COMPLETE INSTRUCTIONS ON SETTING UP A VOICEPRINT PASSWORD isn't easy. Apple has provided some of the steps in the Mac Help files but glosses over important details. Here's the full set of instructions and how to get past a couple of tricky spots:

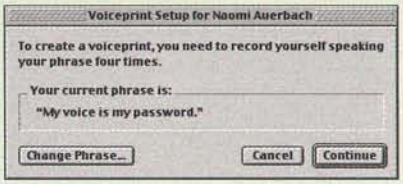
1. Open your Mac's File Sharing control panel and type in a user name and a password (distinct from your Voiceprint password).

2. Open the Multiple Users control panel and enable Multiple User Accounts by clicking on the On button at the bottom of the window.

3. Click on the Options button. Under the resulting window's Login tab, check the Allow Alternate Password check box. Click on Save to go back to the main Multiple Users window.



Create Voiceprint Once you get to this screen, making a Voiceprint password is easy. Start by clicking on the Create Voiceprint button.



Do Your Own Thing Click on the Change Phrase button to use your own password phrase.

4. Select your name from the Multiple Users window and click on the Open button. Select the Show Setup Details option.

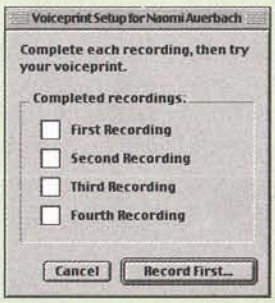
5. Click on the Alternate Password tab (see "Create Voiceprint"). If the tab is dimmed, you probably didn't check the Allow Alternate Password check box in step 3.

6. Click on the Create Voiceprint button and type in the password you used in the File Sharing control panel.

7. When you hit the return key, the Voiceprint Setup window appears (see "Do Your Own Thing"). Click on either the Change Phrase or Continue button.

8. The next step is to record your password four times. To begin, click on the Record First button (see "Record Your Phrase"). Click on Record in the resulting dialog box and speak your password clearly. Click on the Stop button when you're done.

9. Finally, click on the Done button to return to the previous window, where the button will now say Record Second. Repeat the procedure three more times. Voilà—you're now ready to use your Voiceprint password at your next log-in.



Record Your Phrase Voiceprint gains accuracy in distinguishing your unique voice pattern by comparing four separate recordings of your spoken password.

Secrets

Tips, Tricks, and Shortcuts

by Lon Poole

Do you like iDisk Internet storage, available at Apple's new iTools Web site (http://itools.mac.com), enough to want iDisk automatically mounted at start-up? Russell Hearn of Broad Brook, Connecticut, discovered that you can set this up through Mac OS 9's Chooser. First open the Chooser window and click the AppleShare icon, and then click the Server IP Address button. In the dialog box that appears, enter **idisk.mac.com** and click Connect. In the resulting AppleShare dialog box, enter your iTools member name and password, and then click Connect. The next dialog box lists your iDisk volume. If you select the check box next to that volume's name before clicking OK, your Mac will mount iDisk whenever you start up. (If you have the Multiple User Accounts option turned on in the Multiple Users control panel, every time someone logs onto your Mac, it will try to connect to your iDisk volume. But users won't be able to mount iDisk unless they know your iTools password.)

This all works because your iDisk volume is an AppleShare server volume, similar to a shared folder on another Mac on your local network. But iDisk, unlike other server volumes, requires Mac OS 9 for password authentication. This process is necessary even though it's a bit inconvenient—it doesn't let you add your iTools member name and password to your Keychain, and you can't change your password.

An iDisk connection is limited to 60 minutes, and it could slow down your computer—especially if you have a modem connection—so put away iDisk as soon as you're done with it.

You can also mount iDisk using Mac OS 9's Network Browser, but unlike the Chooser, it doesn't let you automatically mount server volumes. However, you can make iDisk mount automatically by putting an iDisk alias in the Servers folder or the Startup Items folder (both are inside the System Folder). If you have trouble disabling automatic mounting later, see the next item.

Multiple Log-in Attempts at Start-Up

Q. Every time I start up my Macintosh with Mac OS 9, three separate dialog boxes ask if I want to connect to the shared folder on the other Mac on our home-office network. I have to click Cancel three times to get past them. What gives?

BOB STOFFER
Holualoa, Hawaii

GENE GREIF

A. You can fix this problem by opening the Servers folder inside the System Folder and removing the aliases of your shared folder (which is a server volume). Mac OS 9 connects to the server volumes that have aliases in this folder at start-up.

Removing the aliases will take care of the problem for now, but it's likely to crop up again unless you manually change one step in the shared-folder–connection process. Whenever you use the Chooser to connect to the folder, in the last step of the process you can check a box next to the shared folder's name. This tells the Mac to mount it at start-up. Selecting this option puts an alias in the Servers folder. If the Servers folder already contains an alias for a particular shared folder, the system creates another alias with a slightly different name. Multiple aliases for the same server volume result in multiple connection attempts during start-up or log-in.

If you want to stop all automatic server connections on a Macintosh with OS 8.6 or earlier, you'll have to use a different method. Remove the AppleShare Prep file from the Preferences folder (inside the System Folder). Then use the Chooser to reinstate the particular automatic server volume connections that you do want.

Change Default Web Browser

Q. When I open a Web site found with Mac OS 9's Sherlock, my Mac uses Microsoft Internet Explorer by default. How do I switch to Netscape Communicator?

DAVID C. RIPLEY
Boulder City, Nevada

A. You need to change the Default Web Browser setting at the bottom of the Web tab in the Internet control panel. (If you don't see any tabs in

continues

this control panel, click the Edit Sets disclosure triangle so that it points down.) Other applications besides Sherlock, such as the Browse The Internet application that normally has an icon on the desktop, use the Default Web Browser setting. In addition, some e-mail programs, such as Microsoft Outlook Express, use this setting for links in e-mail messages (specifically for URLs that begin with *http://*). However, the Mac does not use this setting for links to secure Web pages (whose URLs begin with *https://*) if the links are in any program other than a Web browser. The setting that controls these links is buried under the Advanced tab of the Internet control panel (see "Link to Secure Sites").

Link to Secure Sites In Mac OS 8.5 through 9, you can change the default Web browser for links to secure Web sites. To do so, set the Internet control panel's User Mode setting to either Advanced or Administration (choose Edit: User Mode to change this setting), so you can see the Advanced tab. Under the Advanced tab, click the Helper Apps icon and change the assignment for the https URL type.

One More Shutdown Reminder

TIP Still haven't found the right way to remind yourself to turn off your monitor when you shut down—despite previous tips that suggested using a text clipping, recorded sound, or self-dismissing alert (*Quick Tips*, November 1999 and February 2000)? Chris Lambert of Toronto suggests creating a simple AppleScript application that speaks a reminder. (This requires the text-to-speech software that's normally installed as part of Mac OS 7.6 and later.) Start by opening the Script Editor program. If you have any Mac OS version between 8.5 and 9, enter the following AppleScript statement in an empty script window:

say "Don't forget to turn off your monitor!" using "Ralph"

This script will make your Mac speak the quoted text aloud using the voice of Ralph. You can change the text as you like, and you can select a different voice. If you're not sure which voices are available, open the Speech control panel, set its Options pop-up menu to Voice, and then check out the Voice pop-up menu.

If you have a version of the OS between 7.6 and 8.1, you can't specify the speaking voice, so you'll need to omit the last part of the statement, starting with *using*. You must also change *say* to *speak*.

Once you've finished writing the script, save it in the Shutdown Items folder. In the Save dialog box, set the Kind option to Application and turn on the Never Show Startup Screen option. ■

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. He is a coauthor, with Todd Stauffer, of *Macworld Mac OS 9 Bible* (IDG Books Worldwide, 2000).

All shareware and freeware mentioned in *Quick Tips* is available from the Macworld Online software library (www.macdownload.com).

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Control Panels for Limited Users

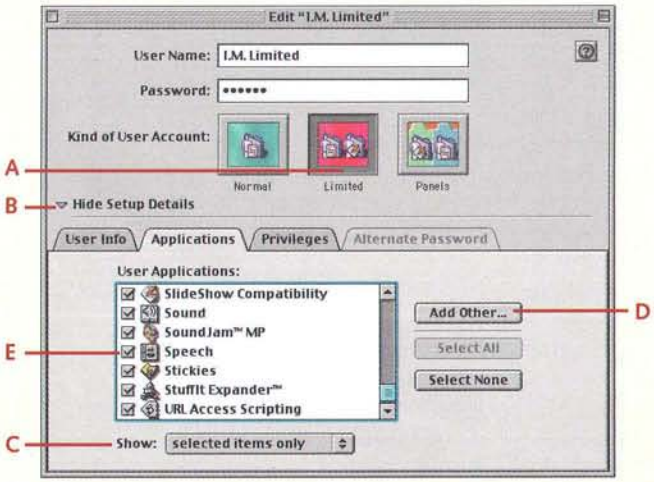
SO YOU WANT TO SET UP A LIMITED USER ACCOUNT—WITH ACCESS TO SOME CONTROL PANELS BUT NOT OTHERS—IN MAC OS 9? At first perusal, the only options in the Multiple Users control panel appear to be access to all or access to none, but Doug Steinhoff of Canyon Lake, Texas, discovered a workaround. Here's what you do.

1. Open the Multiple Users control panel and create or open a user account. Then click the Limited button (A).

2. If you don't see the setup details at the bottom of the control panel, click the triangle next to Show Setup Details (B).

3. Click the Privileges tab and turn the Control Panels option off (rather than on).

4. Click the Applications tab and choose Selected Items Only from the Show pop-up menu (C). This is important; if you choose either of the other options from this pop-up menu, this procedure won't work.



5. Click the Add Other button (D). In the dialog box that appears, select a control panel that you want to allow the limited user to access, then click Open. The selected item appears in the User Applications list (E). Repeat this step to give the user access to other control panels and programs.

The limited user will now be able to access the selected control panels through the Items folder, which normally has an alias on the user's desktop.

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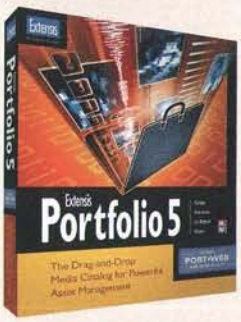

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Scan Right and Save Time

A LITTLE EFFORT GOES A LONG WAY

by Ben Long

Though image-editing programs such as Adobe Photoshop give you extensive control over images, they can also encourage you to develop some bad habits when scanning originals. Because it's so easy to repair and edit an image, many people give short shrift to the scanning process. However, a little effort pre-Photoshop can not only yield better final images but also save the time you might otherwise spend correcting scans.

GORDON STUDER

Preparing to Scan

First, choose the best material to scan. If you're planning on scanning a print but your scanner has a transparency attachment, consider scanning the original negative instead. Film negatives and slides contain much more color information than a photographic print does, affording you more latitude for color adjustments and edits. If your scanner does a better job with reflective material than with transparencies, or if the print was manipulated or corrected in the printing process, then go with the print.

Photoshop's Dust And Scratches filter does an excellent job of removing small bits of dust, fluff, and hair from an image. An even more effective solution is to clean your scanner's platen. A quick once-over with a soft cloth, paper towel, or sheet of newspaper might be all it takes to remove tiny bits of dust that can be visible in a high-resolution scan. For fingerprints, any type of glass cleaner will work, but check the scanner manual first to be sure that the platen is cleanser-safe.

Picking Places

Though you might be in the habit of laying an original anywhere on the scanner's platen, its *sweet spots* can provide sharper focus and, therefore, better detail and truer color. Scanners with particularly large platens—legal- or tabloid-size, for example—are more prone to differences in focus quality across their scanning surface. Transparency attachments on flatbed scanners are particularly susceptible to changes in quality from point to point. (Of course, when an image fills the entire platen, sweet spots are irrelevant.)

To test for sweet spots, select a high-quality image with good contrast, fine detail, and bright colors. Scan it several times, with the image on a different part of the platen each time. Open all the scans in your image editor and arrange the windows so you can simultaneously view the same section of each scan. Color reproduction should be the same in each scan. If you're using Photoshop, grab the eyedropper tool and check the color values of the same areas of each image. Are they the same? If not, decide which you like best.

Next, zoom in to a high magnification on each image and look for sharpness and focusing problems. In addition to outright blurriness, check for halos of red, green, or blue that may indicate a slight focus problem.

When one image looks better, repeat the test with a different image to make sure you have indeed found a sweet spot.

If you're scanning a transparency, be sure to place the slide or negative in the scanner correctly. Most scanners require the emulsion side (the side of the slide that's less shiny) to be facedown, but check your documentation to be sure.

Defining Settings

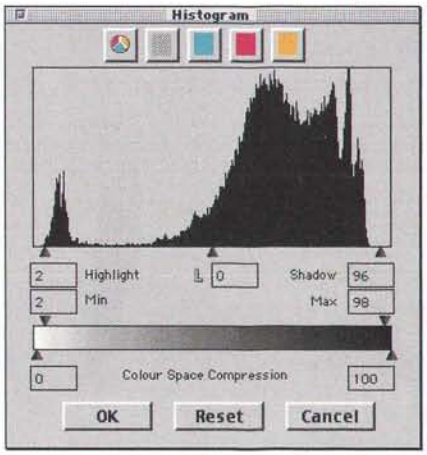
Before you hit that scan button, you need to define some settings in your

continues

software. Most scanners include some type of Photoshop-compatible Acquire plug-in that lets you scan directly into an image-editing application. If your scanner includes such a plug-in, it's a good idea to use it rather than a dedicated scanning application, simply because you won't have to switch between two programs. An Acquire plug-in may even prevent you from accidentally compressing an image as you move it from the scanning application to the image editor.

First, set your scanner to scan in color. In fact, once you've made the setting, leave it there, even when you scan a black-and-white original. Some scanners don't record as much information when set to black-and-white, so you're better off scanning in color and later converting the image to gray-scale. Photoshop does a much better job of converting a color image to black-and-white than your scanner does.

Selecting a resolution is the most important decision you'll make when configuring your scanner. Scan too low, and you'll end up with blurry details and dull color. Scan too high, and you'll not only spend more time scanning and printing but may also have less detail in your final image. See the sidebar, "You Say You Want a Resolution," for more information.



Scanner Controls Most scanning software includes variations on Photoshop's Levels and Curves dialog boxes. Though the controls look a bit different, taking the time to learn them can result in better color reproduction.

When scanning a transparency, select negative or positive. Don't count on your image editor to invert the image. The scanner needs to know that a negative is a negative.

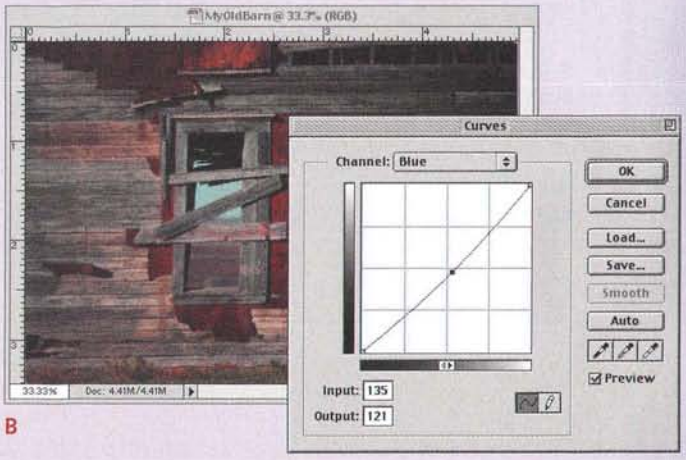
Many slide scanners include *profiles* for different types of film; some even allow you to create new profiles. A profile is a description of a film type's color characteristics; scanners use the description to adjust their settings. Because different film types can have widely varying color gamuts, it's worth taking the time to choose the right profile. Check your scanner documentation for details.

Before you scan a slide or negative using a flatbed scanner's transparency attachment, determine whether your scanner software provides focusing controls. Most drivers include automatic focusing, and though it takes longer to make the scanner check its focus before scanning, the extra time is worth it. See your manual for details.

You should also turn off any sharpening options. Sharpening is a necessary step, but you don't want the scanner to do it. For optimum quality, it's best to perform sharpening after you've made all other adjustments and edits.

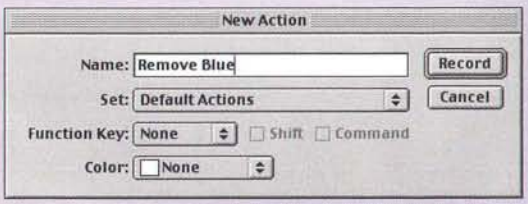
WHAT TO DO WHEN A SCAN IS TOO BLUE

A



B

SOME SCANNERS REGULARLY PRODUCE IMAGES WITH THE SAME INCORRECT color cast. The easiest way to solve this problem is to alter the image in an image-editing application, such as Adobe Photoshop, after scanning. This image (A) is from a scanner that regularly produces images with roughly the same amount of blue cast. With a simple Curves adjustment (B), we remove the cast. By recording that adjustment as an Action (C), we can quickly apply it to any image with the click of a mouse.



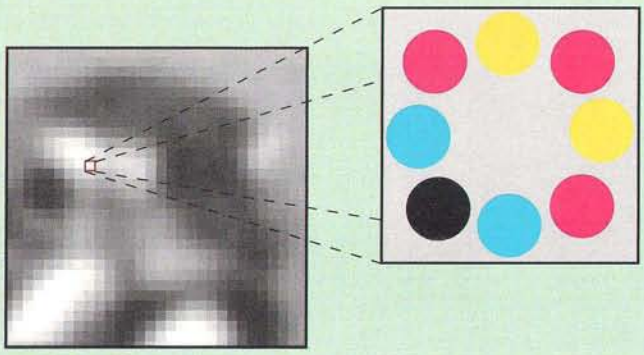
C

YOU SAY YOU WANT A RESOLUTION

CHOOSING A RESOLUTION IS NOT AS SIMPLE AS IT SEEMS. The first thing to understand is that there isn't a 1:1 relationship between a dot on your screen and a dot on your printer. So though your printer may boast 1,440 dots per inch (dpi), you don't need anywhere near that resolution in your scan.

Most printers—whether ink-jet, dye-sub, laser, or offset—have only four colors: cyan, magenta, yellow, and black. Four-color printers lay down patterns of dots that we perceive as other colors when we view them from a distance (see "True Colors"). By contrast, each pixel on your computer screen can be any one of 16 million different colors (assuming your monitor is set to display that amount).

So your printer might reproduce one dark-blue pixel on the screen by creating a pattern of dozens of cyan, magenta, and yellow dots. High-resolution printers can use even more dots, but they still represent that *one* pixel on your computer screen. The higher printer resolution just means you're less likely to see the individual dots making up the patterns that represent colors.



True Colors One pixel in an image does not equal one dot on the printed page. A printer uses many dots of ink for each pixel in an image. When a printer manufacturer claims 1,440 dots per inch, it means printer dots, not image pixels.

If the resolution of your file is too low, the printer doesn't have enough data to accurately print detail and color. But if your image resolution is too high, the computer must throw out data, or downsample, before it sends the image to the printer. Downsampling can result in a loss of sharpness and detail, so you should control it when possible. Select a resolution that will provide enough data to create a good image but not so much that the computer will average away detail upon printing.

If your image's destination is an offset press, you need to know the frequency of the *halftone screen* the printer will use before you can choose the best image resolution. This halftone frequency is usually measured in lines per inch (lpi). Magazines and most good-quality commercial print jobs are usually printed with a halftone frequency of 133 lpi. If your image's final destination is newsprint or photocopies, the printer will probably use a halftone frequency of around 85 lpi.

Many people recommend scanning at a resolution that's twice your final line screen. That means 266 dpi for an image that's destined for a 133-lpi print job. We think it's better to go even lower—around 1.25 to 1.5 times the line screen—to ensure your image doesn't downsample so much that it loses sharpness.

If your image is destined for a desktop ink-jet printer, 200 dpi is usually all you'll ever need. This resolution also works well for laser printers, though you can often go as low as 150 dpi with them.

If your image is headed for a large-format printer, rules for choosing a resolution are mostly the same as those for desk-top and commercial printers. Because you're printing something that's, say, 3 feet wide and 5 feet long, you may think you need a superhigh resolution, but you don't.

Large-format-printer drivers include special algorithms for scaling images up, and most do wonders with relatively low-res images. We've successfully printed 8-by-10-inch 300-dpi images at massive sizes with excellent results. Consult your service bureau for the nitty-gritty.

Scanners that can capture 600 or 1,200 dpi give you the ability to enlarge an image. Say you've got an image that's 2 inches square and you want to print it at 6 inches square on your desktop ink-jet printer. Because you want to have a final resolution of 200 dpi (the ideal ink-jet resolution), you should scan at 600 dpi. In an image editor, you can resize the 2-by-2-inch 600-dpi image to a 6-by-6-inch 200-dpi image with no loss of data and no interpolation.

Using Those Extra Bits

Each pixel that makes up a full-color digital image is composed of 24 bits of color data. So why are there 30-bit and 48-bit scanners? The additional bits may seem like marketing hype, but they can actually provide a more accurate image—if you use the scanning software properly.

You can take advantage of those extra bits by using the scanning software, whether it's stand-alone or a Photoshop-compatible plug-in. Like Photoshop, the scanning software has controls for adjusting color, contrast, and levels. However, your computer is limited to 24 bits of color, while scanners can often process color at greater bit depths. When you use the scanner software's color controls, it makes adjustments using its larger color space (see "Scanner Controls"); it then downsamples the images to 24-bit color. Why bother with the scanner software when the images end up at 24 bits? Because those extra bits make possible more-precise calculations and finer color-correction control.

As in Photoshop, when your scanner software offers a choice of adjustment types—levels versus simple brightness and contrast adjustments—always use the levels controls. With the less precise brightness and contrast sliders, you may inadvertently change an image's whites and blacks. Levels controls let you adjust contrast while preserving white and black points.

Performing good color correction takes practice, but some general advice can help—whether you're using scanner software or a stand-alone image editor:

- An image has three basic color categories: highlights, shadows, and midtones. When you see that color is off in an image, determine which of these categories suffers the most. For example, a typical portrait is mostly midtones, with

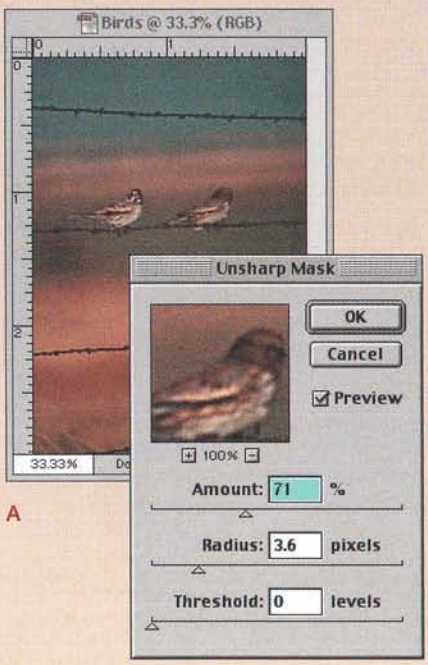
continues

BRING SCANS INTO FOCUS

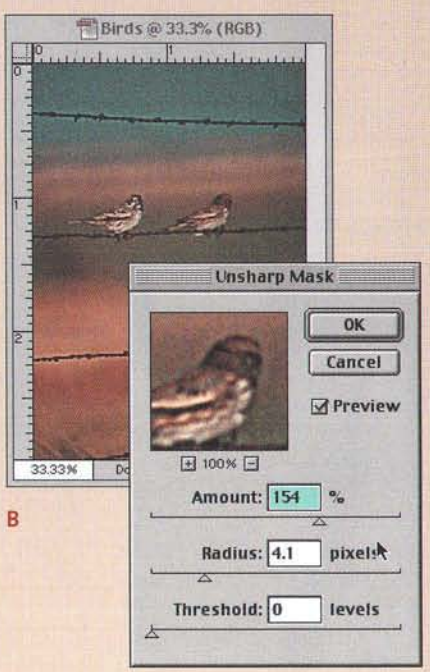
ALTHOUGH SCANNING CORRECTLY saves you a lot of trouble, there are some problems you can't avoid. For example, even the best of desktop scans are less sharp than the original photographs. In these cases, an image editor's sharpening feature can help restore what was lost. Photoshop's Unsharp Mask filter (under the Sharpen submenu in the Filter menu) is a popular choice.

Properly applied (A), the Unsharp Mask filter improves the appearance of a fuzzy photo. But if you oversharpen (B), colors alter and artifacts such as the halo around the bird's head appear.

One cautionary note: Be sure to wait until you've performed all other edits before applying sharpening.



A



B

dark shadows spread here and there and highlights on the hair, nose, or glasses. If the portrait has a green cast, correct midtones first.

- Once you've corrected the central problem, touch up problems in other categories. In the previous example, after you'd removed the greens from the midtones, you would work on the highlights and then on the shadows.
- Be sure to check the balance of all three categories—adjusting one range of colors sometimes affects the others.

One caveat: If you're preparing images for the Web or a device with a limited gamut, this kind of color control can be overkill.

Saving Time, Saving Files

So you've meticulously tweaked Levels and Curves adjustments and maniacally calculated just the right resolution. Now it's time to preserve those settings. If you shot a number of pictures in the same location, there's a good chance that they'll need roughly the same color correction and adjustments. If your scanner software can't save settings as a file, you should at least write them down. If you changed locations, film stock, or lighting from one picture to the next, you'll probably have to start from scratch and build new settings.

After you scan an image, save it as a TIFF or PSD file, no matter how you plan to use it. Though the file may be bound for the Web, Web-ready JPEG and GIF files are *lossy* formats—that is, they degrade image quality—so you shouldn't convert to either GIF or JPEG until you perform all edits. And don't throw out your original scan after the conversion. If you make changes later, perform the edits in the original and then convert to JPEG. Resaving JPEG files removes even more data.

Postprocessing

Scanning can introduce some annoying artifacts. If the original is a halftone image from a book or magazine, there's a good chance that moiré patterns have crept in. An image editor's Despeckle filter should remove them in one or two passes. Your scanning software may include descreen functions. Experiment with these to see whether they remove the moiré without oversoftening the image.

Some scanners produce images with distinct color casts. You can usually remove the cast using a simple Curves adjustment in an image-editing program. If your scanner routinely produces the same color cast, consider building an Action in Photoshop that performs the appropriate adjustment (see "What to Do when a Scan Is Too Blue").

Save sharpening for after you resize the image and convert it from RGB to grayscale. Be sure to use an Unsharp Mask filter rather than a raw Sharpen filter. Unsharp masking produces images with smoother contrast and without oversharpened halos (see "Bring Scans into Focus"). For more on sharpening, see "Sharper Images in Photoshop," *Create*, April 2000.

It's easy to get crooked scans from flatbed scanners. Fortunately, Photoshop's Measure tool provides a simple way to straighten an image. In your image, find a line that should be horizontal. Select the Measure tool, and click on both ends of that line. Then select Rotate Canvas: Arbitrary from the Image menu. The resulting dialog box automatically displays the amount of rotation required to straighten your image. Click on OK, and the image is straightened.

Not a Toaster

With scanners as inexpensive as household appliances, it's tempting to treat them the same way. However, scanning isn't yet as routine as making toast. Be mindful when you scan, and you can get better results from a low-end scanner than others could with a more expensive device. **m**

BEN LONG is a freelance writer and illustrator in San Francisco.

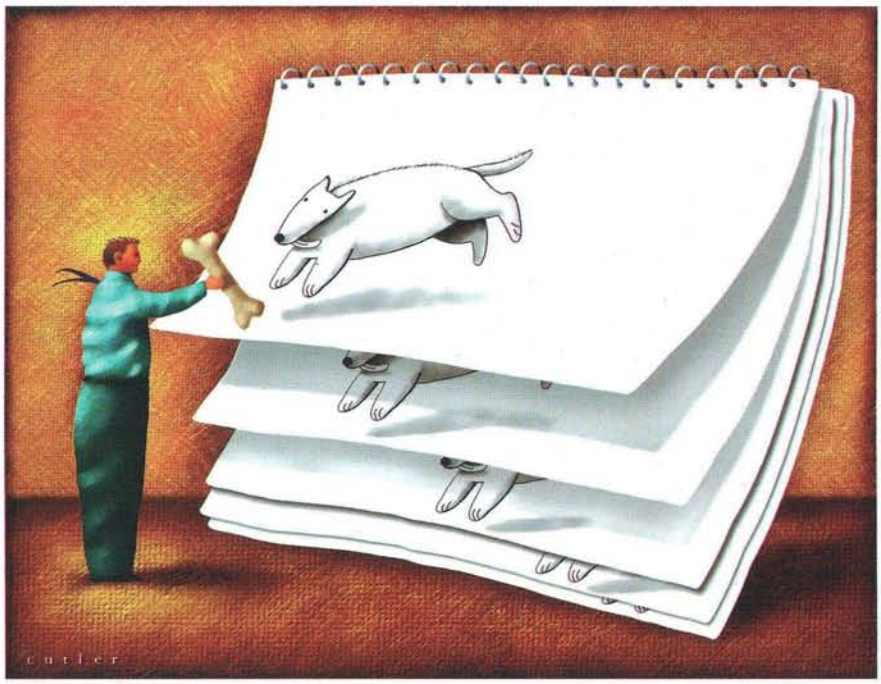
Fireworks' New Moves

EXPAND YOUR ANIMATION HORIZONS WITH VERSION 3

by Sandee Cohen

As a longtime print person—and a New Yorker—my motto used to be "If it moves, step on it." But that was before I discovered the joys of GIF animations. Seeing my artwork move, fade, and change appearance was thrilling. I even started watching the Cartoon Network to pick up animation tips.

But despite the pleasing results, creating those first animations was no picnic. I used Macromedia Fireworks 1, which required a cumbersome set of steps to set up an animation and couldn't play files without opening a special Export dialog box. Fortunately, Fireworks 3 is a powerful, sophisticated tool that makes it easy to turn artwork into animations.



DAVE CUTLER

Fireworks' Frames and Layers

Fireworks is a frame-based program; an animation is composed of any number of frames, each displaying a slightly different image. The concept is similar to a flipbook—an object changes from page to page (or from frame to frame) to create the illusion of movement. (Adobe After Effects and Macromedia Flash are timeline-based, which makes them much more powerful than frame-based animation programs, but harder to understand and use.)

Fireworks also uses layers. As in Adobe Photoshop, layers control the vertical stacking of objects in a file. In Fireworks, you can have several layers in each frame, and you can change each layer's content and visibility. If, for example, you want to make the word *help* blink on and off, you can place it in layer 1 of all frames but make that layer invisible in alternating frames. By hiding the layer rather than deleting it, you have the option of changing it later if you—or a willful client—opt for a different look. You can share a layer across frames either manually or automatically.

The Power of Tweening

You can produce animations by manually placing an object on each frame and changing its position by hand, but it won't take long for your patience—and your mousing hand—to give out. It's much easier to take advantage of Fireworks' *symbols* and *instances*.

Any object can be a symbol—you simply select it and choose Insert: Symbol. This designates it the master or parent of all copies—called instances—of the object. Rather than copy and paste an object onto each frame, you can use the Tween Instances command to distribute instances automatically across frames.

That's useful enough, but Fireworks' tweening capabilities go even further. Using the Tween Instances command, you can also fill in the steps between two instances. Say you place one instance of a floral bouquet in a frame's bottom left corner and another instance in the next frame's top right corner. Tween the two instances, and Fireworks adds frames between them that show the flowers gradually moving from corner to corner. (See the sidebar "Animate with Symbols.")

Animation Looks Lively

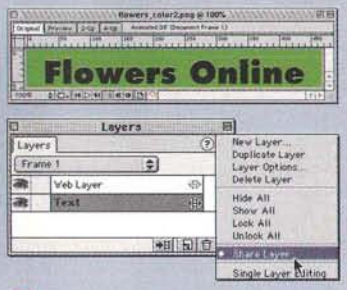
You can tween a wide range of symbol attributes in Fireworks 3. Just as you made the flower instances move from corner to corner, you can animate differences in the size, rotation, and skew of two instances. You can also alter their opacity so that, when you tween them, an object appears to fade in or out.

Fireworks 3 features Live Effects that offer new opportunities for animation. Drop shadows can move, glows can fade

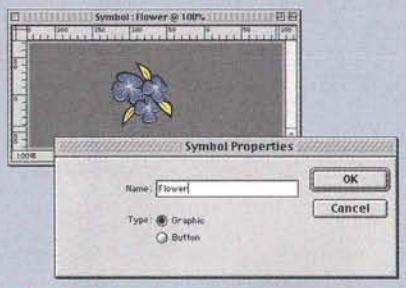
continues

Animate with Symbols

FIREWORKS' SYMBOLS AND INSTANCES MAKE IT EASY TO CREATE ANIMATIONS. HERE, I SHOW YOU HOW TO ROTATE an object. (For the final animated GIF, see www.macworld.com/2000/05/create/.)



1 Put the object that will appear on all frames on its own layer, and choose Share Layer from the Layers palette's pull-down menu.



2 Create a new layer to hold the objects you will be animating; then choose Insert: New Symbol. Name the symbol in the Symbol Properties dialog box, and then paste existing artwork into the Symbol window or create it directly in that window.

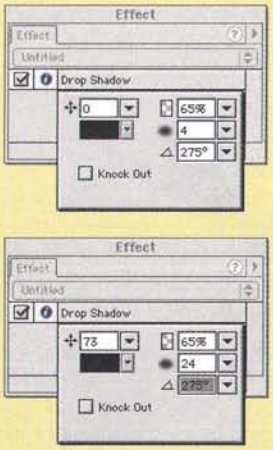
3 Close the Symbol window. An instance of the symbol automatically appears in the main window. Position this instance where you want the animation to start. Copy the instance and position the copy where you want the animation to end. Select the second instance and go to Modify: Transform: Rotate 180 Degrees.

4 Select the two instances and choose Modify: Symbol: Tween Instances, then set the number of steps. Select Distribute To Frames to put all the intermediate steps on their own frames. The tweened instances fill in the spaces and rotate the flower.

Animate a Live Effect

FIREWORKS EFFECTS SUCH AS DROP SHADOWS AND BEVELS AREN'T JUST FOR STILL IMAGES ANYMORE. FOR EXAMPLE, you can animate an object to make it look like it's moving toward the viewer as its shadow moves away. (For the final animated GIF, see www.macworld.com/2000/05/create/.)

1 Create an instance of an object, open the Effect palette, and go to the Shadow And Glow drop-down menu to set the instance's Drop Shadow distance to 0. (Although you can't see the shadow at this setting, you have to apply an effect to both instances for tweening to work.) Copy the instance onto a new frame and set its Drop Shadow to 73, the final distance.



2 Select both instances and go to Modify: Symbol: Tween Instances. Enter a number of frames appropriate for the effect you want. The new instances fill in the intermediate distance settings for a moving-shadow effect.

in and out, instances can go in and out of focus, and objects' hues can change. (See the sidebar "Animate a Live Effect.") You can even apply Photoshop filters to instances for unusual, artistic animations. (See the sidebar "Animate Photoshop Filters.") For a different effect, import blends from Adobe Illustrator or Macromedia FreeHand to simulate one shape morphing into another. (See the online sidebar, "Morph Shapes from Vector Objects," at www.macworld.com/2000/05/create/.)

Automatic Animation With Fireworks 3, you can speed up the animation process by automating steps with JavaScript commands. There are two ways to create these commands. The first is to use Fireworks' History panel to record your actions and then save them as a command. This method has a limitation: if you want to repeat a command several times, you must manually record each repetition in the original history. (See the online sidebar, "Study Animation History," at www.macworld.com/2000/05/create/.)

Fortunately, if you're not afraid of a little JavaScript programming, you can whip up a command without having to add every frame and go through each action manually. Several commands ship with Fireworks (just look in the program's Commands folder), and you can modify these in a word processor. Say you open the command that adds 12 frames and rotates an object 30 degrees. The phrase **// Add frames for the animation var kNumFrames = 12;** in the command tells the application to add 12 frames to the animation. To add a different number of frames, simply change the number. The phrase **var angle = 30;** controls the size of the rotation. Change the 30 to, say, 10, and you set the rotation to 10-degree increments.

Once you've modified an existing command, save it as a text-only file and place it in Fireworks' Commands folder. The modified action now appears under the Commands menu.

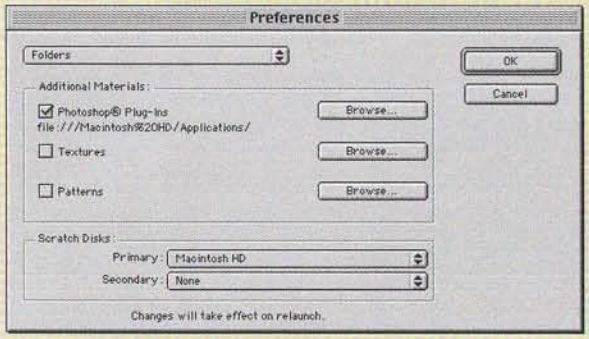
You may not have to dip into JavaScript at all. Many people create commands and post them for others to use. Check out Massimo Foti's www.massimocorner.com and Kleanthis E's http://projectzero.webhostme.com for a bevy of prewritten commands.

Although Fireworks has come a long way, there's still room for improvement. For example, unlike Flash 4's, its tweened animations aren't live: to change a first or last instance, you have to re-create the entire animation. But Fireworks 3 does provide Web animators with an impressive array of well-designed tools. ■

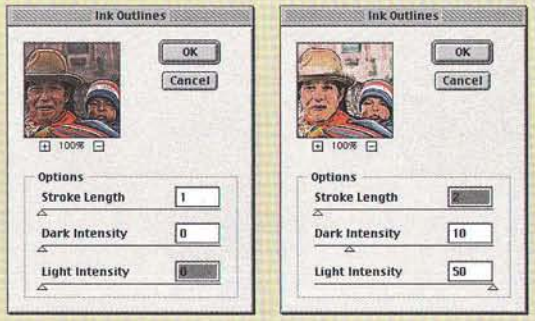
SANDEE COHEN is the author of *Fireworks 3 Visual Quick-Start Guide* (Peachpit Press, 2000) and a frequent speaker at Thunder Lizard conferences and Seybold seminars.

Animate Photoshop Filters

IN FIREWORKS 3, YOU CAN APPLY PHOTOSHOP FILTERS AS LIVE EFFECTS AND ANIMATE THEM. (FOR THE FINAL animated GIF, see www.macworld.com/2000/05/create/.)



1 Start with a bitmap image. Make it a symbol, and copy an instance of that symbol to a frame. Use Fireworks' Preferences dialog box to point to the Photoshop Plug-ins folder, which adds the plug-ins to Fireworks' Effect panel. (A few filters, including Lighting Effects and Twirl, don't work in Fireworks and won't appear in the Effect panel.)



2 Choose a Photoshop filter and apply it at a very low setting to the instance of the image. In this example, I've applied the Ink Outlines filter to the image. Duplicate this instance and change the filter to a higher setting.

3 Tween the two instances and distribute the intermediary instances to frames. The resulting animation looks like a photograph changing into a sketch.

Create

GRAPHICS

Designs with a Difference

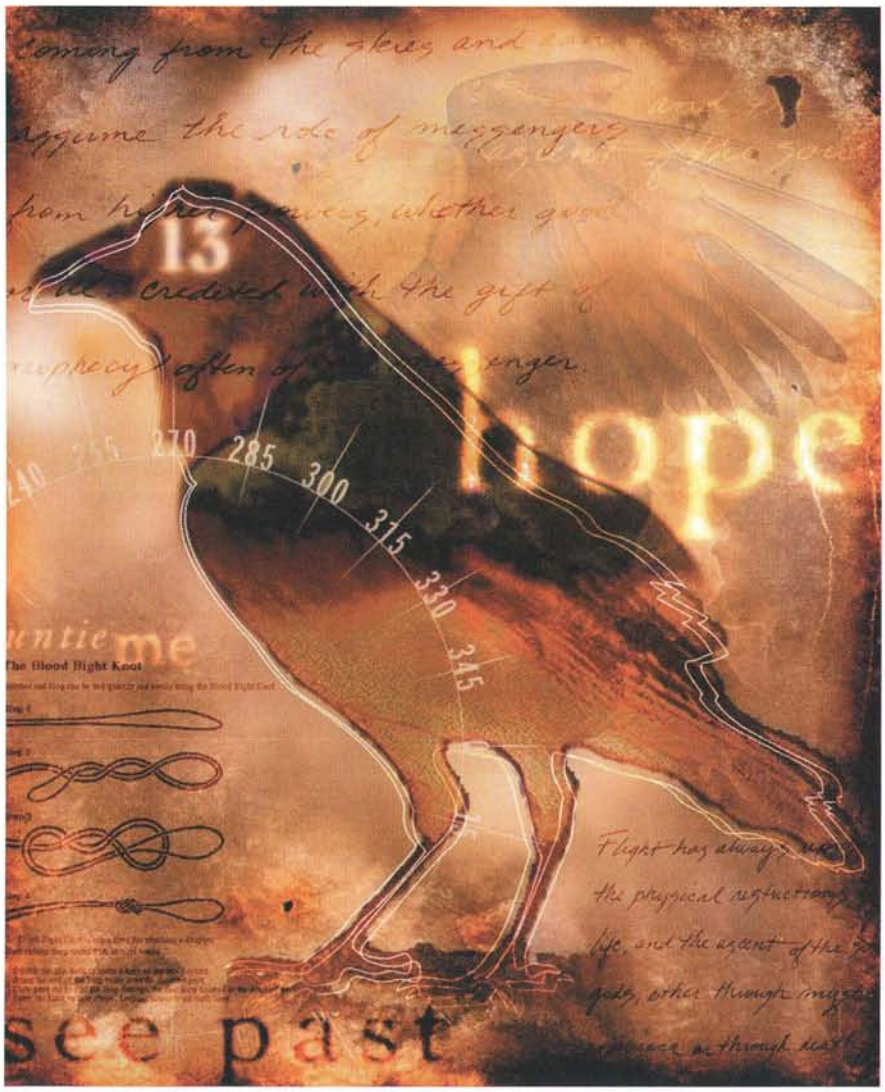
PHOTOSHOP'S DIFFERENCE MODE GETS A MAKEOVER

by Cathy Abes

You can get startling, even psychedelic effects in Adobe Photoshop by using that program's blending modes, which determine how color information on two different layers interacts when you combine the layers. Some blending modes—like the aptly named Normal—produce fairly ordinary results, while others give you a radically changed image. One of the most popular is Difference mode, which produces highly saturated color. The problem with using such a popular mode, though, is that its effects are so predictable, they're easy to spot in an illustration.

Graphic designer and photo-illustrator Alicia Buelow is an ardent fan of Difference mode, but she doesn't like the idea of using a one-effect-fits-all mode, as it's likely to make her illustrations look too much like someone else's. And while she appreciates the dramatic effects this mode provides, she doesn't like what she considers its colorful excesses. She gravitates toward a palette of earth tones rather than the intense blues and greens characteristic of Difference. Fortunately, Buelow found a way to make Difference behave differently. She devised a technique involving copying and pasting images that lets her tone down the mode's effect (see Step 4).

Buelow designed *Ascendence* as a self-promotional piece, using Photoshop 5.5 on a 333MHz Power Mac G3 with 256MB of RAM. She's a former Adobe employee who has worked with Photoshop and Illustrator since the early days of both programs. m



A Subtler Difference After undergoing some judicious customizing, the image of the crow retains the dramatic effect produced by Difference mode, while taking on an earthier color palette.

CATHY ABES, author of *Photoshop F/X* (Ventana Press, 1994) and formerly an editor at *Macworld* and *Publish*, has been writing about graphics and publishing for more than ten years.

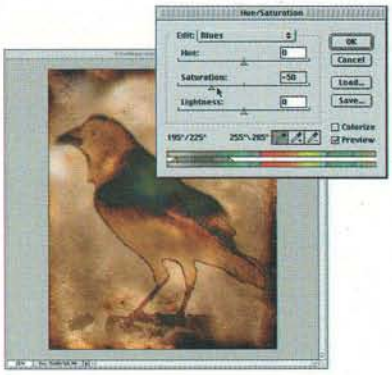
1 After creating a background, Buelow pieced together the crow image from three photos (two of her own and one stock photo) and added it to a layer on top of the background. She made the crow image a single color by selecting Colorize in the Hue/Saturation dialog box. To make the crow blue so it would stand out against the brownish gold background, she moved the Hue slider about halfway to the right.

2 Buelow inverted the crow layer (Image: Adjust: Invert) and then applied Difference blending mode at 100 percent opacity. Inverting the crow image before applying Difference mode produced a more dramatic effect than if she had used Difference mode alone.

3 The next step was to get a psychedelic effect that she could later tone down. To do so, Buelow selected the crow layer, duplicated it, and merged the duplicate and the original with both layers set on Difference blending mode. As she expected, the result was an overly saturated and unnatural-looking bird, but one with some desirable effects.

4 Once you set a layer to Difference mode, you can't get rid of the saturated colors without losing the high-contrast effect. Buelow devised a way to work around that limitation. To begin, she saved a copy of the image as a flattened Photoshop file by checking the Flatten Image check box in the Save A Copy dialog box. With the layered image still open, Buelow opened the flattened image and selected the crow by going back to the layered image, choosing the marquee tool, and ⌘-clicking on the icon of one of the crow layers. Then she clicked inside her selection with the marquee tool and dragged the selection over the crow in the flattened image. When she let go, the crow in the flattened image was automatically selected. Finally, she copied and pasted the crow from the flattened image into the layered image.

5 Now that Buelow had an image that looked like it was in Difference mode but was actually in Normal mode, she could select that image's layer and adjust colors (in the Hue/Saturation dialog box) without losing the high-contrast effect.



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*Product is reconditioned by an Apple Authorized Service Provider. Reconditioned computers may not include original application software. 90 day parts and labor warranty. All sales final. While supplies last. **Free memory offer does not apply.**

Many other reconditioned Apple systems available. See page 8 for details.

MAC OS 9

Only $69.95!* after $30 in rebates.

Item #SYS1012

See page 6 of 9 for details!

- **Sherlock 2** – Your Internet detective, and personal shopper.
- **Voiceprint** – Your voice is your password.

For more information visit: www.warehouse.com/macos9.

***Price after Apple $20 mail-in upgrade rebate and MacWarehouse $10 mail-in rebate.** Before rebates: $99.95. Apple rebate requires proof of ownership for OS 8.5, OS 8.51 or OS 8.6. Rebate coupon in box. Offer expires 5/1/2000. MacWAREHOUSE rebate limit one per customer (or 5 per customer site.) MacWAREHOUSE rebate coupon available at www.warehouse.com/rebate/applesoftware or call us at 1-800-390-0706. Not to be combined with other MacWAREHOUSE offers. Rebate expires 5/1/2000.

Free! 64MB RAM — 400MHZ iMAC DV

after rebate. Installation fee required.

Ask for item #AAP1115 and #INSTL10.

See page 4 of 9

- 400MHz PowerPC G3 Processor • 64MB of SDRAM (exp. to 512MB) • 512K Backside Level 2 Cache • 10.0GB Ultra ATA HD • 4X (max.) DVD-ROM drive • Built-in 56K V.90 modem

Blueberry: item #CPU1493
Grape: item #CPU1494
Lime: item #CPU1496
Tangerine: item #CPU1497
Strawberry: item #CPU1495

$1299! ea.

Lease It! for §38/mo§

EPSON STYLUS COLOR 740

USB EPSON

Only $99.95!* after $50 rebate

Item #PR14065

- 1440 x 720 dpi
- USB and Mac serial compatible
- 6ppm black/5ppm color
- Smaller ink drops for amazing detail

*Price before manufacturer's mail-in rebate is $149.95 – $50 rebate = $99.95. Rebate coupon and full details available at www.warehouse.com/rebate/epson or call us at 1-800-390-0706. Offer expires 7/31/2000.

SONY MAVICA FD-91 DIGITAL CAMERA

Only $999.95!

Item #IN7502

- 14X optical zoom
- 2.5" Color LCD
- Auto flash
- 1024 x 768 ppi resolution
- 3.5" floppy disk storage

SONY.

Free! 64MB RAM — 400MHZ iMAC DV SPECIAL EDITION

after rebate. Installation fee required.

Ask for item #AAP1115 and #INSTL10.

Same features as iMac DV PLUS:

- 128MB SDRAM • 13GB HD
- See-thru Graphite Color

$1499!

Lease It! for §44/mo§

Item #CPU1498

See page 5 of 9

***Free 64MB RAM Upgrade AFTER MacWAREHOUSE $100 mail-in rebate when you purchase an Apple PowerMac G4, PowerBook G3, iBook or iMac DV.** Price before rebate is $129.95. Installation fee of $29.95 required. Visit www.warehouse.com/rebate/macwarehouse for mail-in rebate coupon or call us at 1-800-390-0706 to request one. Offer not valid on purchase of 333MHz iMacs, 350MHz iMac, or any reconditioned computer. MacWAREHOUSE reserves the right to terminate this offer at any time. Offer expires 4/30/2000.

§Leases are available to business customers with approved credit on product orders where at least one product totals $750 or more. Payments are based on a 48-month Lease. Leasing terms subject to change without notice. Call for complete details.

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Buy any Power Mac G4 —

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Starting at $14.99! ea.

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USB

250MB Zip USB Drive

Only $179.95!

DR11308

- USB compatible
- Backwards compatible
- 56% smaller than original USB Zip Drive

Zip 250MB Disk 4-pack, ask for item #ME8138, only $69.95

GL1 Digital Video Camera

Only $2499.95!

IN8223

- 20X Optical Zoom
- 100X Digital Zoom
- FireWire input and output • 3 CCD image sensors

Canon

warehouse.com/canon/DV

Update! QuarkXPress 4.1

Trade-up for only $299.95!*

SID1004

Precise layout tools and control over every aspect of your document!

QuarkXPress 4.1 Full Version, ask for item #DTP1040, only $729.95

*For PageMaker owners. Serial number required at time of purchase. Packaging shown may vary from shipped product.

Kodak DC290 Zoom Digital Camera

New Low Price!

Only $899.95!

was ~~$999.95~~

IN8305

- 3.3 megapixels in Ultra Mode
- 3X optical/2X digital zoom lens
- USB and serial cables included
- 2" color LCD

Kodak

Apple Power Mac G4

New! *Now up to 500MHz!*

As low as $1599!

Lease It! for as low as $47/mo.§

Model shown is CPU1574. Monitor sold separately.

The Gigaflop is Here!

The Power Mac G4 runs at over a gigaflop — a billion floating-point operations per second!... and a full 100% to 200% faster running Photoshop than the fastest Pentium® III processor-based PC!*

*Based on Apple internal benchmark tests.

Order Online at www.macwarehouse.com

Apple 17" Studio Display

Only $499!

- 17" Diamondtron CRT (16" viewable)
- 1600 x 1200 @ 60Hz
- Graphite and ice to match the Power Mac G4

Item #MON1044

Apple 21" Studio Display

Only $1499!

- 21" screen (19.8" viewable)
- 1600 x 1200 @ 85Hz
- Graphite and ice to match the Power Mac G4

Item #MON1043

Power Mac G4 Memory

128MB PC100 SDRAM

Only $299.95! each

- 100MHz DIMM

Item #CHP0691

Memory prices subject to change.

PAGE 2 OF 9

- Our sales staff is ready to take your order 24 hours a day, 7 days a week. We accept the following major credit cards: Visa, MasterCard, Discover Card/NOVUS, AmEx. Your credit card will not be charged until each item is shipped (no surcharge). CT, IL, NJ and OH residents add applicable sales tax.
- Shipping Charges & Delivery. Overnight delivery for non-GSA orders is $9.95 per order up to 5 pounds. For all orders over 5 pounds, shipping is $9.95 plus an additional $1.80 per pound or fraction thereof. (Example: shipping for a 6 pound order is $11.75). Please add an additional $3.00 for orders $50.00 and under.
- Orders for "in-stock" items placed on weekdays up until 12:00 midnight (E), 11:00 pm (E) for Internet orders, ship same day for overnight delivery (barring system failure, etc.). We anticipate being able to ship "out-of-stock" items within 30 days.
- Every item we sell comes with our 30-day guarantee against defects. If a product is defective in any way, please call us within 30 days of the original invoice date. You will be transferred to a Technical Support Representative to verify the defect. Upon verification, you will be issued a Return Merchandise Authorization (RMA) number. RMA numbers issued by Micro Warehouse are valid for 15 days only, and the product(s) must be received by Micro Warehouse within that time. RMA numbers cannot be extended or re-issued. Defective software will be replaced upon receipt of the defective product. Defective hardware will be replaced or repaired at our discretion, except for products from Apple (1-800-SOS-APPL, 1-800-767-2775), Tektronix (1-800-835-6100), or Minolta printers (1-800-459-3250). These manufacturers must be contacted directly, and will repair or replace products at their sole discretion. Should you return hardware to MacWAREHOUSE from Apple or Tektronix, you will be assessed a 15% restocking fee which will be charged to your account. We cannot accept returns of Minolta printers. All returns are subject to the following: 1. All products must be returned in original packaging. 2. Shipping and handling charges are not refundable. 3. Software and consumables are not refundable unless returned unopened in original packaging with documentation. 4. Custom orders and cables are not refundable. 5. Products designated as "all sales final," "no returns," or similar language may not be returned.

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Get 64MB RAM FREE!*

CALL FOR A FREE FULL-COLOR CATALOG!

Nikon • Adaptec • Tektronix • EPSON • AGFA • Apple • Iomega • Quark

Free!* 64MB RAM UPGRADE!

after rebate, when you purchase a Power Mac G4!

Ask for item #AAP1114 and INSTL10. Installation fee required.

***Free 64MB RAM Upgrade AFTER MacWarehouse $100 mail-in rebate.** Price before rebate is $129.95. Installation fee of $29.95 required. Visit www.warehouse.com/rebate/macwarehouse for mail-in rebate coupon or call us at 1-800-390-0706 to request one. Offer not valid on purchase of reconditioned Power Macs. MacWAREHOUSE reserves the right to terminate this offer at any time. Offer expires 4/30/2000.

Power Mac G4 Features:

- ✔ PowerPC G4 processor with speeds up to 500MHz
- ✔ Velocity Engine with advanced vector processing
- ✔ Superfast 100MHz system bus and 1MB Backside Level 2 Cache running at half the processor speed
- ✔ Up to 256MB PC100 SDRAM, expandable to 1.5GB
- ✔ Up to 27.0GB ATA/66 hard drive space
- ✔ DVD-ROM or DVD-RAM drives — both with video playback
- ✔ Built-in 100MB Zip drive (CPU1575, CPU1576)
- ✔ 56K modem (CPU1574, CPU1575)
- ✔ Built-in 10/100Base-T Ethernet
- ✔ Built-in antenna and support for optional Airport wireless networking
- ✔ ATI RAGE 128 Pro graphics card with 16MB of graphics memory installed in an AGP 2X slot
- ✔ Four expansion slots: three 64-bit PCI slots and one dedicated AGP 2X graphics card slot
- ✔ Three FireWire ports
- ✔ Two USB ports
- ✔ Mac OS 9 system software

Speed to Burn!

The next generation of Power Macs™ are built around the blazing PowerPC™ G4 processor to play multimedia and crunch data at lightning-fast speeds! It's the fastest machine ever designed to run graphics applications like Adobe Photoshop, InDesign and QuarkXPress. Blink, and you'll miss it!

More Speed Than Megahertz Alone!

The speed secret is in the processing — 128-bit chunks, instead of 64 or 32-bit chunks. No wonder a G4 can perform many tasks at twice the speed of a Pentium® III processor* — even when the megahertz speeds look the same!

New! 400MHz!

Power Mac G4/400MHz
400MHz G4 processor/64MB SDRAM/10.0GB Ultra ATA/66 HDD/DVD-ROM/56K modem
Item #CPU1574 ..... $1599!
Lease It! for as low as $47/mo.§

New! 450MHz!

Power Mac G4/450MHz
450MHz G4 processor/128MB SDRAM/20.0GB Ultra ATA/66 HDD/DVD-ROM/56K modem/Zip Drive
Item #CPU1575 ..... $2499!
Lease It! for as low as $73/mo.§

New! 500MHz!

Power Mac G4/500MHz
500MHz G4 processor/256MB SDRAM/27.0GB Ultra ATA/66 HDD/5.2GB DVD-RAM/Zip Drive
Item #CPU1576 ..... $3499!
Lease It! for as low as $102/mo.§

§ Leases are only available to business customers with approved credit on product orders where at least one product totals $750 or more. Lease payments are based on a 48-month Lease. Call today to see how you can qualify. Lease terms are subject to change.

USB AGFA 1212U Scanner

Only $69.95!* IN7951 after $30 rebate

While supplies last!

- Translucent Bondi blue
- 36-bit color
- 600 x 1200 ppi

*Price AFTER mfr's $30 mail-in rebate. Rebate coupon available at www.warehouse.com/rebate/agfa, or call us at 1-800-390-0706 to request one. Offer expires 6/30/2000.

EPSON Stylus Color 850 Printer

Mac Serial Compatible!

Only $249.95! PR13559

- 9ppm black; 5.5ppm color
- 1440 x 720 dpi
- Mac USB and Serial

USB EPSON

New! Nikon CoolPix 990 Digital Camera

Only $949.95! IN8547

USB

- 3.3 Megapixel resolution
- 3x Nikkor zoom lens
- 8 shooting modes

Nikon

Adaptec PowerDomain 2930U Ultra SCSI Adapter

Ideal for Power Mac G3 and G4!

Only $89.95! DRI3165

- 20MB/sec. transfer rate
- Internal & external connectors • Bootable

adaptec

Phaser 850N Printer

Tektronix

Only $2495! PR16084

- 14ppm color/1000 dpi
- Adobe PostScript Level 3
- 10/100Base-T
- ColorSync ready

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FREE 64MB RAM Upgrade –

Broderbund • Apple • Iomega • Hewlett Packard • Umax • Kensington • Sony

FileMaker Pro 5 Upgrade/Trade-up

Only $139.95! UPG1102

Qualifying products: Any previous version of FileMaker, Acius 4th Dimension 6.0, 6.5, Microsoft Access 95, 97, 2000, Lotus Approach 96, 97, and Corel Paradox 7, 8, 9.

FileMaker

USB Floppy Drive

Available in 6 colors!

Only $84.95! DR12164

VST

Imation Mac Neon 3.5" Disk 10-pack, only $5.90 (only 59¢ each!), #MED0540

HP DeskJet 932c Color Printer

Only $199.95! PR16052

- USB compatible only
- 9ppm blk; 7.5ppm clr • PhotoREt III technology

Black Ink Cartridge, only $19.99, item #PR14329.

iMac USB Hubs

4-Port only $49.99! ea.

- Stackable up to 127 peripherals

Xircom

DEH4727: Blueberry
DEH4729: Tangerine

UMAX Astra 2100U Color Scanner

New Low Price!

Was $129.95: Now only $99.95! IN7925

- 36-bit
- 600 x 1200 dpi optical resolution

UMAX

Free!* 64MB RAM UPGRADE!

after rebate, when you order any iMac DV or iMac DV Special Edition!

Ask for item #AAP1115 and INSTL10. Installation fee required.

*Free 64MB RAM Upgrade AFTER MacWarehouse $100 mail-in rebate. Price before rebate is $129.95. Installation fee of $29.95 required. Visit www.warehouse.com/rebate/macwarehouse for mail-in rebate coupon or call us at 1-800-390-0706 to request one. Offer not valid on purchase of 333MHz iMacs, 350MHz iMac, or any reconditioned iMac. MacWAREHOUSE reserves the right to terminate this offer at any time. Offer expires 4/30/2000.

Cooler, Sleeker iMacs - Mixed 3 different ways!

1 Apple iMac 350MHz Blueberry

- 350MHz PowerPC™ G3 processor
- 512K Backside Level 2 Cache
- 64MB of SDRAM (exp. to 512MB)
- 6.0GB Ultra ATA HD drive
- 24x (max. variable) CD-ROM
- Built-in 56K V.90 modem
- ATI RAGE 128 VR 2D/3D graphics accelerator with 8MB SDRAM (AGP 2X)
- Odyssey audio system from Harman Kardon
- 15" color display
- 10/100BASE-T Ethernet
- 2 USB ports (12Mbps ea.)
- Support for AirPort 11Mbps wireless networking

(antenna built-in; AirPort card optional)

Only $999!† #CPU1492

†Free Memory Offer does not apply

Lease It! for $29/mo.[1]

2 Apple iMac DV 400MHz

Includes ALL the GREAT Features of the 350MHz Model – PLUS –

- 400MHz Processor
- Slot-loading DVD drive
- Movie-making software
- Two FireWire ports
- 10.0GB Ultra ATA HD drive

Only $1299! each

Lease It! for $38/mo.[1]

Lime: Item #CPU1496 | Blueberry: Item #CPU1493 | Strawberry: Item #CPU1495 | Tangerine: Item #CPU1497 | Grape: Item #CPU1494

IDOCK 2 USB MULTIPORT HUB

COMPUCABLE

- Floppy drive
- Swivel Base
- 4 USB ports
- 2 Serial ports
- 1 ADB ports

Includes 3.5 floppy drive!

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A $29.95!** Value

FREE* with any purchase from MacWAREHOUSE Item #AAA0742

- Challenge your puzzle-solving skills in the Island world that is Myst!

*$3.95 shipping and handling applies. Shipped in promotional packaging. Hurry! Offer good while supplies last.
**Value based on MacWAREHOUSE pricing as of this magazine printing.

Broderbund

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Orbit USB for Mac

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- Designed specifically for use with USB
- Fits the natural shape of your hand; ideal for right- or left-handed users • Manufacturer's 5-year warranty

KENSINGTON

HP DeskJet 895cse Printer

Only $249.95! Ask for item #PR14208.

- 11ppm black • 8.5 ppm color
- PhotoRet II technology • USB compatible

Black Ink Cartridge, only $29.99, item #67208.

Sony Digital FD73 Mavica

Only $499.95! Ask for item #IN7834.

- 10x optical zoom • E-mail mode • 2.5" Color LCD • VGA resolution • Quick Access 2X Floppy Disk Drive • Picture effect • File copy/disk copy

SONY

WAREHOUSE.com

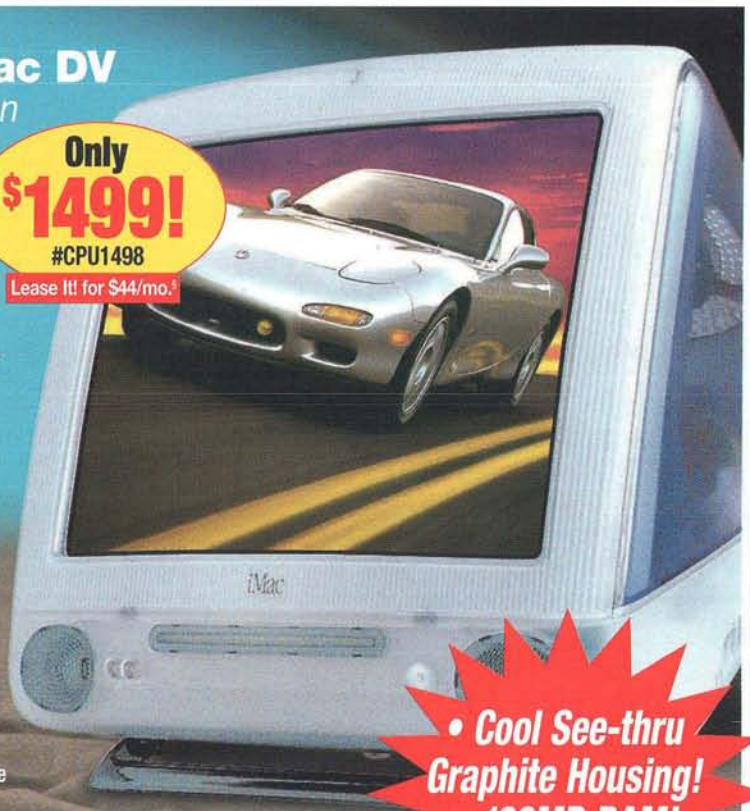
when you order any iMac DV!

VST • Epson • Aladdin • Xircom • Farallon • Microsoft • XLR8 • Intuit

3 Apple iMac DV
Special Edition

- 400MHz PowerPC™ G3 processor
- 512K Backside Level 2 Cache
- 128MB of SDRAM (exp. to 512MB)
- ATI RAGE 128 VR 2D/3D graphics accelerator
- 13.0GB Ultra ATA HD drive
- 4X max. DVD-ROM drive
- Built-in 56K V.90 modem
- 15" color display
- Harman Kardon Odyssey Audio System
- 10/100BASE-T Ethernet
- Dual FireWire ports
- Two 12Mbps USB ports
- Support for AirPort 11Mbps wireless networking (antenna built-in; AirPort card optional)
- Preinstalled iMovie software

Only $1499!
#CPU1498
Lease It! for $44/mo.§



• Cool See-thru Graphite Housing!
• 128MB RAM!
• 13.0GB HD!
400MHz!

Get MORE POWER for your 350 — 400MHz iMac!

Our Apple Authorized technicians will install your RAM for only $29.95 when you purchase your new iMac and memory upgrade together!

Ask for item #INSTL30.

Size/Type	Item #	Price
32MB PC100	CHP1041	$99.95
64MB PC100	CHP1037	$199.95

Memory prices subject to change.

Iomega 100MB USB Zip Drive

Only $129.95!
DR9464
Zip Disk sold separately.

Iomega 100MB Zip Disks
as low as $8.99! each, in 20-pk.

20-pack (gray): only $179.80, #BND3616.

EtherMac iMac iPrint Adapter with built-in PhoneNet!

Only $104.99!
DEP1734

- Connects your iMac to LocalTalk printers and other Macs
- Easy plug-and-play installation

Farallon

Ethernet iPrint Adapter for Stylewriter, only $79.99, #DEP1739.

Canon ELURA DV Camera

Was $1599.95: Now Only $1499.95
IN8176

- 12X Optical/48x Digital Zoom
- IEEE 1394 Terminal In & Out
- 2.5" LCD & Color Viewfinder

Quickbooks Pro 4.0

Only $179.95!
FIN1007

- Timesheet functions
- Generates customizable estimates
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- Previous data from QuickBooks or Quicken is automatically updated to QuickBooks Pro 4.0!

Intuit

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Special Edition!
For iBook and iMac customers only!

Only $89.95!* after rebate
WP3072

Includes Word 98, Internet Explorer 4.5 and Outlook Express 4.5.

***Price AFTER publisher's $30 mail-in rebate.** Before rebate: $119.95. Rebate coupon in box. Offer expires 7/31/2000.

MICROSOFT OFFICE 98

Microsoft

Includes:
- Word 98 • PowerPoint 98
- Excel 98 • Outlook Express.

Upgrade only $249.95!
Item #UPG0778

Microsoft Office 98 Full Version BUS1150 ..... $419.95

EPSON STYLUS COLOR 740i PRINTER

- Blueberry cover standard
- 1440 x 720 dpi with smaller ink drops• 6ppm blk; 5ppm clr
- USB/Mac serial compatible

Other color covers available for only $14.95 each! Call for details.

EPSON

Only $129.95!* after $50 rebate
Item #PR15063

***Price BEFORE manufacturer's $50 mail-in rebate is $179.95–$50 rebate=$129.95.** Rebate coupon available at www.warehouse.com/rebate/epson, or call us at 1-800-390-0706 to request one. Offer expires 7/31/2000.

Black Ink Cartridge: PA1582 ..... $29.99

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New Apple PowerBook

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MYST

FREE!* with any purchase from MacWAREHOUSE AAA0742 — A $29.95 Value!**

- Challenge your puzzle-solving skills in the Island world that is Myst!

*$3.95 shipping and handling applies. Shipped in promotional packaging. Hurry! Offer good while supplies last.
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USB to Serial

Only $59.99! DAD1665

- Use your Mac or iMac USB port to connect serial modems, digital cameras, graphic tablets, printers, and PDAs
- Supports either the Mac modem or printer port

Palm VII Connected Organizer with MacPac 2

Only $449.95! BND3797

Features Web Clipping to retrieve stock quotes, and other Internet* information.
*Internet access requires activation and a monthly Palm.Net server fee. Service provided by 3Com

Palm VII

Olympus D-360L

1.3 MEGAPIXEL! Only $299.95! IN8569

New!

OLYMPUS

- 2x digital zoom • 8MB Smartmedia card included
- 1.3 Megapixel • 1.8" Ultra-bright color LCD

SupraExpress V.90 56K* Modem

Only $79.99!** after rebate DMD3503

DIAMOND MULTIMEDIA COMMUNICATIONS DIVISION

*Capable of receiving data up to 56Kbps. Actual send and receive speeds may vary.

**Price AFTER manufacturer's $20 mail-in rebate. Price before rebate: $99.95. Rebate coupon available at www.warehouse.com/rebate/diamond or call us at 1-800-390-0706. Offer expires 3/31/2000.

HP LaserJet Printers

HEWLETT PACKARD — Expanding Possibilities

HP LASERJET 8000N Only $2449! Ask for item #PR13724. Lease It! for $71/mo.[5]
- Prints 24ppm • 1200 dpi max. resolution
- 133MHz RISC processor

HP LASERJET 2100M
- Prints 10ppm
- 1200 dpi resolution
- HP PostScript Level 2
- LocalTalk connectivity

HP LaserJet 2100M $749! Item #PR14691

HP LASERJET 8000 SERIES BLACK TONER CARTRIDGE Only $179.95 ea. Item #63223

HP LASERJET 2100 SERIES BLACK TONER CARTRIDGE Only $109.95 ea. Item #PA1871

HP LASERJET 8100 SERIES BLACK TONER CARTRIDGE Only $219.99 ea. Item #PA1662

HP LASERJET 8500 SERIES BLACK TONER CARTRIDGE Only $109.99 ea. Item #PA1644

HP LASERJET 4050 SERIES BLACK TONER CARTRIDGE Only $94.95 ea. Item #PR13025

HP LASERJET 5000 SERIES BLACK TONER CARTRIDGE Only $169.99 ea. Item #PR13742

HP LASERJET 4050N Only $1379.95 Ask for item #PR14947. Lease It! for $40/mo.[5]
- Prints 17ppm
- 1200 dpi maximum resolution
- 100MHz RISC processor
- Ethernet 10Base-T/10Base-2 + LocalTalk

HP LASERJET 8100N
- Prints 32ppm • 1200 dpi

Item #PR14315 .....Lease It! for $80/mo.[5] $2779.95

HP COLOR LASERJET 8500N
- Prints 24ppm blk/6ppm color • 600 dpi

Item #PR14213 ....Lease It! for $181/mo.[5] $6359.95

HP LASERJET 5000N (not shown)
- Prints 16ppm • 1200 dpi • Prints 3" x 5" thru 11" x 17"

Ask for item #PR13443 .....Lease It! for $57/mo.[5] $1969.95

MAC OS 9

Upgrade only $69.95!* after $30 in rebates

Item #SYS1012

FREE† SOFTWARE BUNDLE! Including Spring Cleaning and many other software titles, with the purchase of Mac OS 9. Ask for item #AAA1043.

PLUS... **FREE†† iTools from Apple** with purchase of Mac OS 9!

Features you'll love!
- Sherlock 2: Easily find people, news, and shopping on-line!
- Easy-to-use, functional interface
- Compatibility with popular search engines such as AltaVista, CNET, Excite, Infoseek, and Lycos
- Plug-ins that search popular sports, financials, and news sites such as CNN and ESPN
- Ability to search multiple shopping and e-commerce sites at the same time
- Built-in Open GL for accelerated 3-D graphics and an improved gaming experience

*Price AFTER Apple $20 mail-in upgrade rebate and MacWAREHOUSE $10 mail-in rebate. Before rebates: $99.95. Apple rebate requires proof of ownership for OS 8.5, OS 8.51 or OS 8.6. Rebate coupon in box. Offer expires 5/1/2000. MacWAREHOUSE rebate limit one per customer (or 5 per customer site.) MacWAREHOUSE rebate coupon available at www.warehouse.com/rebate/applesoftware or call us at 1-800-390-0706. Not to be combined with other MacWAREHOUSE offers. Rebate expires 5/1/2000.

†3.95 shipping & handling applies.

††iTools is free to Macintosh® users running the Mac OS 9 operating system, and can be accessed at www.apple.com. See box for details.

VIEWSONIC P810 21"

ViewSonic on top

- 21" screen (20" viewable)
- .25mm dot pitch
- 1800 x 1440 @ 73Hz resolution
- Manufacturer's 3-year warranty

Only $862.95! Item #MT3320

IOMEGA 100MB ZIP DISKS

New Low Price! $8.99! each, in 20-pack

Item #BND3616

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FREE CD-R 10-pack when you buy a 100MB Zip Disk Color 10-pack! While supplies last. Item #AA1740.

PAGE 6 OF 9

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Only 99¢ each, in 50-pack spindle

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- 74 min. • 650MB

IMATION

3Com U.S. Robotics 56K* V.90 FaxModem

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- Reads and writes 3.5" floppies
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TARGUS

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- Lithium-Ion

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ACC3307 (fits 1998 models) shown, only $199.95

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- 366MHz PowerPC G3 processor
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- 24x max. variable CD-ROM
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- Optional Airport support

Apple iBook 366MHz G3
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Item #CPU1579

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- Optional Airport support

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Tangerine: item #CPU1578

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32MB iBook, PowerBook G3 Memory only $99.95! each
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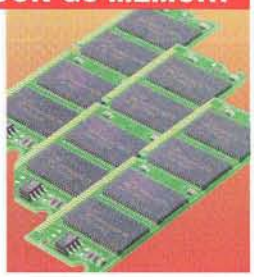

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AirPort Card for iBook only $99!
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Only **$139!**
DRI3505

newer technologies

Fits in CardBus slot

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Palm Vx

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Apple iMac 350MHz

- 350MHz • 64MB SDRAM
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- 4X DVD-ROM • 56K modem • 15" monitor

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Blueberry: #RCPU1493 • Grape: #RCPU1494 • Lime: #RCPU1496 • Strawberry: #RCPU1495 • Tangerine: #RCPU1497

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RECONDITIONED

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RECONDITIONED

G3 PowerPC

Blueberry, shown.

*Reconditioned system. Reconditioned computers may not include original application software. 90 day parts and labor warranty. All sales final. While supplies last. Free memory offer does not apply.

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- 90MHz PowerPC 601 processor
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iomega

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*Price BEFORE mfr's mail-in rebate is $399.95 – $50 rebate = $349.95. Rebate coupon in box. Offer expires 5/31/2000.

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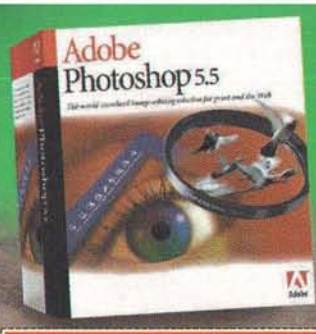

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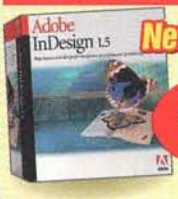

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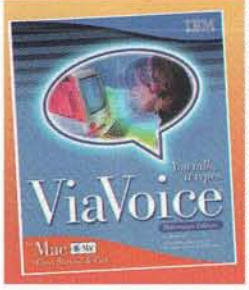

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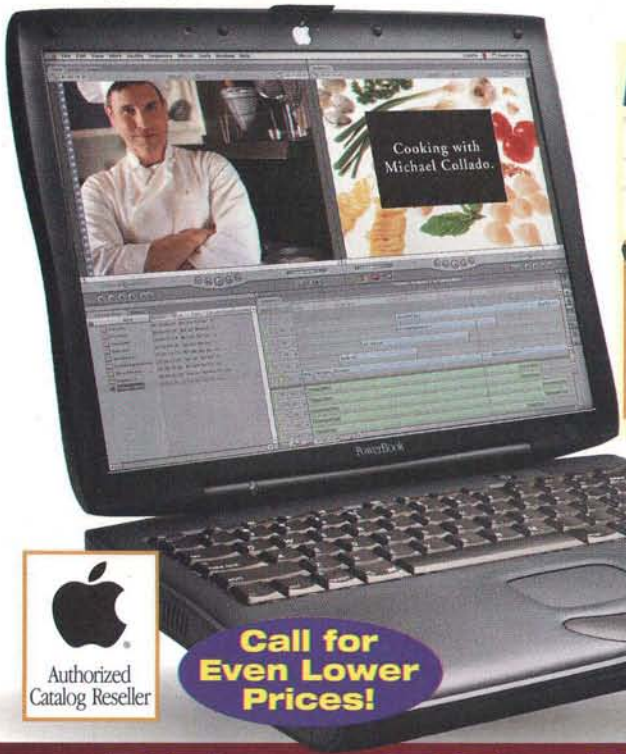

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- 366MHz processor
- Stylish Graphite Color
- 64MB RAM
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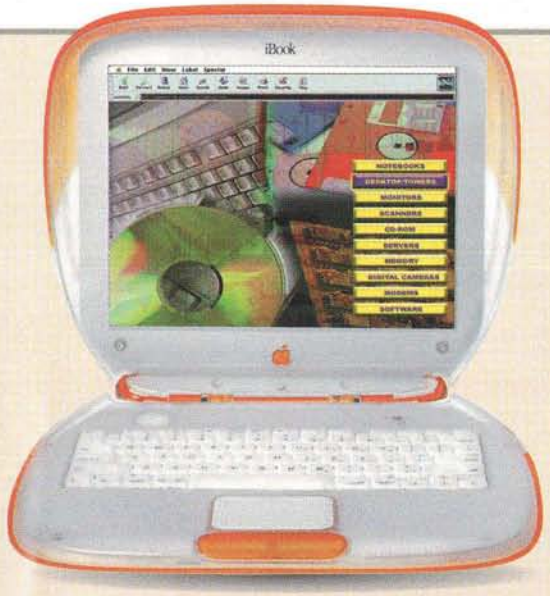
366MHz Graphite iBook Special Edition

only $1,794

#57635

**See page 3 for details on the MacMall EZ Payment Plan*



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Now iBook gives you more choices than ever. With twice the memory, twice the memory expandability, and nearly twice the hard disk capacity, there's even more to love about the new iBook. In addition, you can now get the new iBook Special Edition, which offers even more power in a very stylish Graphite color.

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- Mac OS 9

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- 10, 20 or 27GB Ultra ATA hard disk
- DVD-ROM drive or DVD-RAM drive
- 100MB Zip drive (some configurations)
- Built-in 10/100BASE-T Ethernet networking; optional Gigabit Ethernet

Advanced capabilities

- Three 400Mbps FireWire ports
- Two USB ports—up to 127 devices at once
- Optional AirPort wireless networking card
- Two additional internal drive bays
- Three 64-bit PCI slots
- Now enhanced for Adobe Photoshop
- Includes Mac OS 9

Great graphics and video features

- ATI RAGE 128 Graphics Accelerator with 16MB of SDRAM graphics memory
- Support for up to 1,920 by 1,200-pixel resolution at 32 bits per pixel (millions of colors) and up to 85Hz refresh rate
- Hardware acceleration of graphics and video
- Advanced integrated triangle setup engine
- Single-pass multi-texturing design

Design elegance

- Translucent silver and graphite case
- Easy, drop down accessibility for installing cards, drives, and memory
- Convenient, built-in handles for easy carrying

Monitor sold separately.

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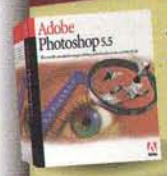

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- 512K backside level 2 cache on processor module
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- Internal 24X (maximum) slot-loading CD-ROM drive or DVD-ROM Drive (DVD is in DV models only)

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- Two 6-pin FireWire ports running at up to 400Mbps (DV models only)

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Want to play movies or even make some of your own? An iMac DV model is your personal theatre for viewing DVD movies. Simply connect your favorite DV camcorder to the FireWire® port and use Apple's groundbreaking iMovie software to create your own digital movies. And iMac DV models include built-in video mirroring for making presentations!

All models include:
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*See page 3 for details on the MacMall EZ Payment Plan

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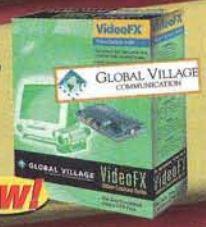

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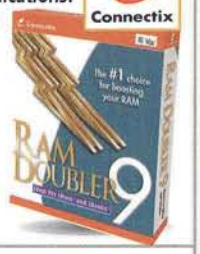

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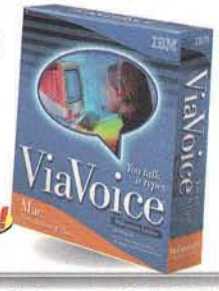

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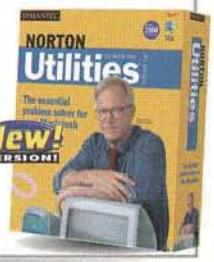

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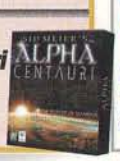

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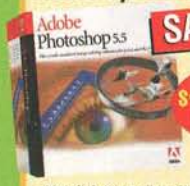

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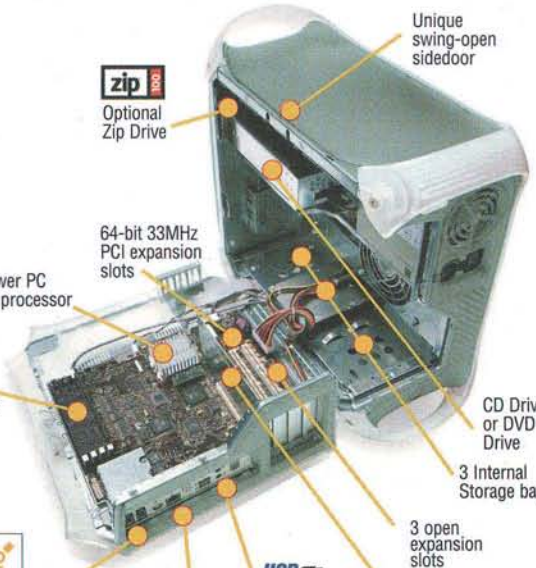

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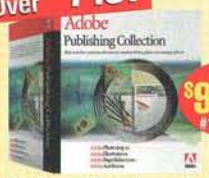

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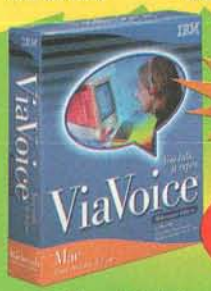

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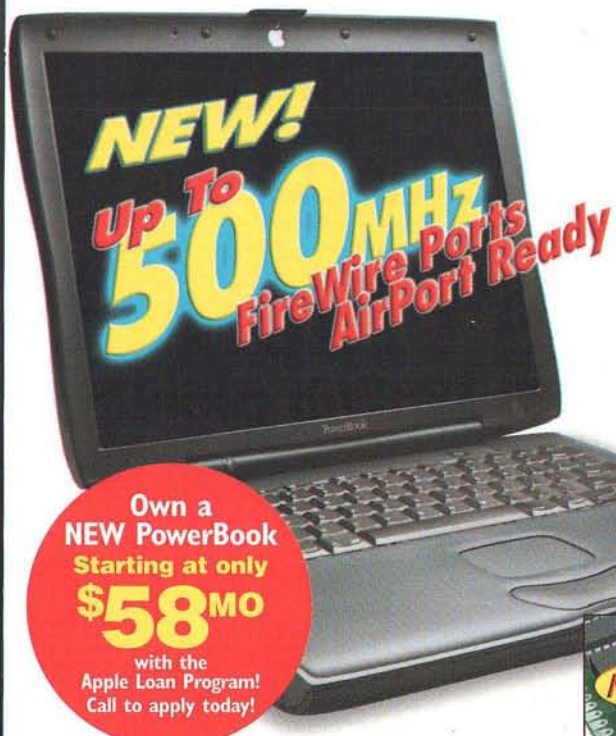

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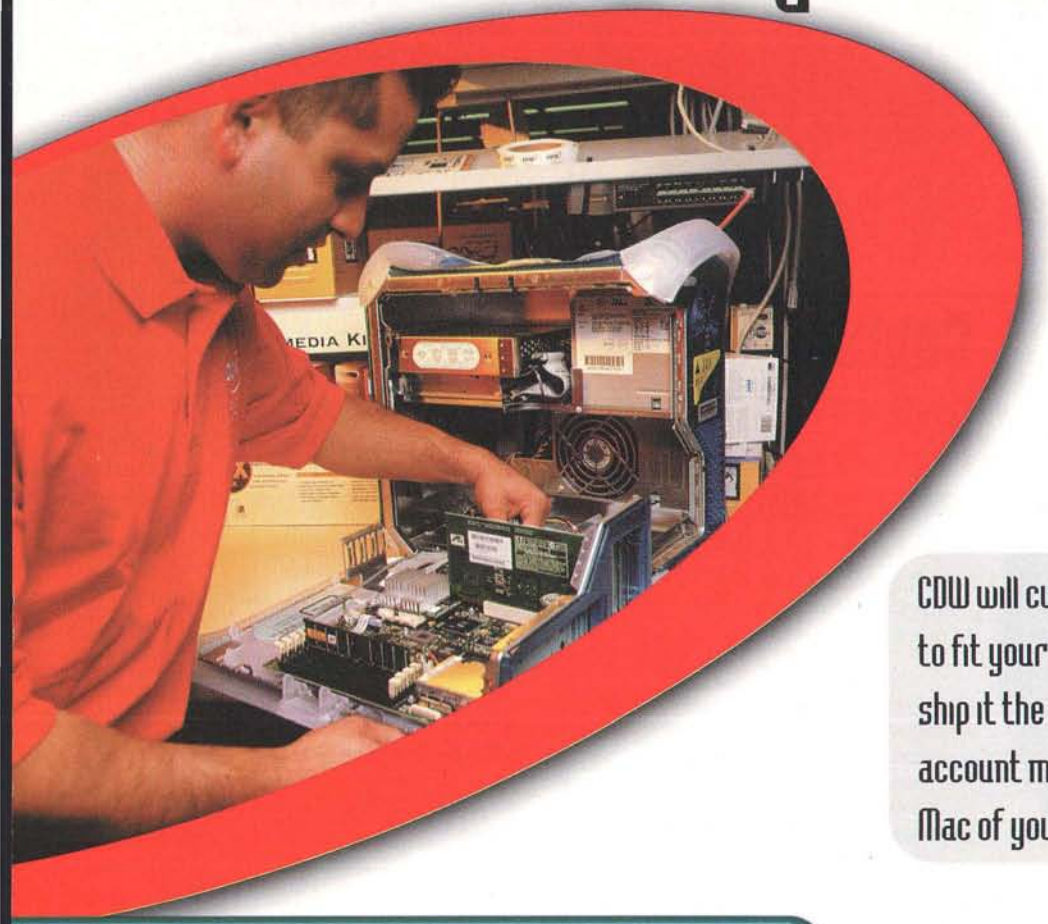

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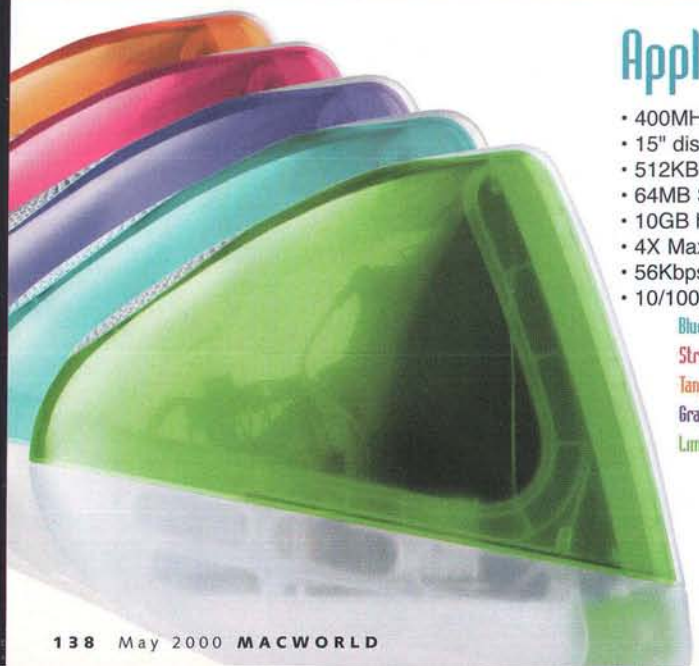

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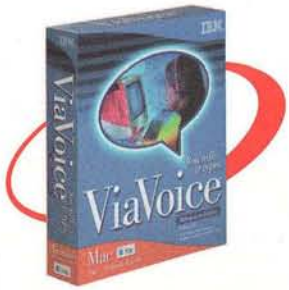

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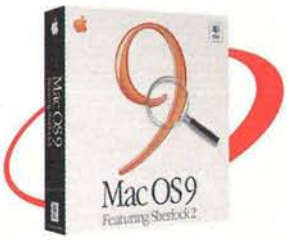

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2GB Jaz disk 2-4/5-9/10+	$85/80/77
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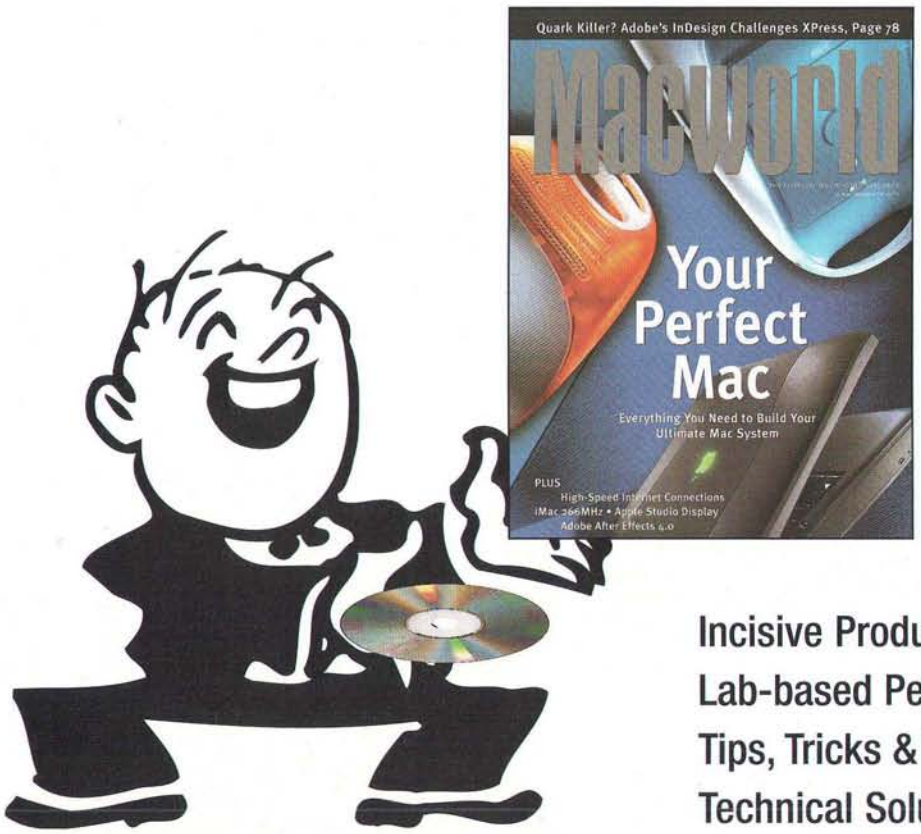

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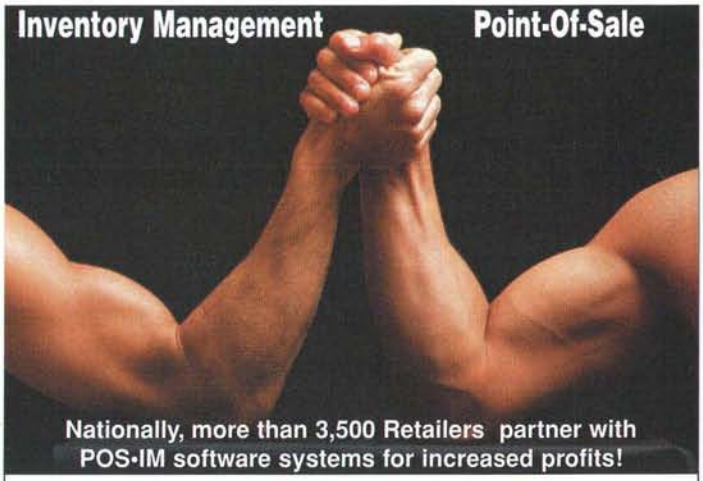

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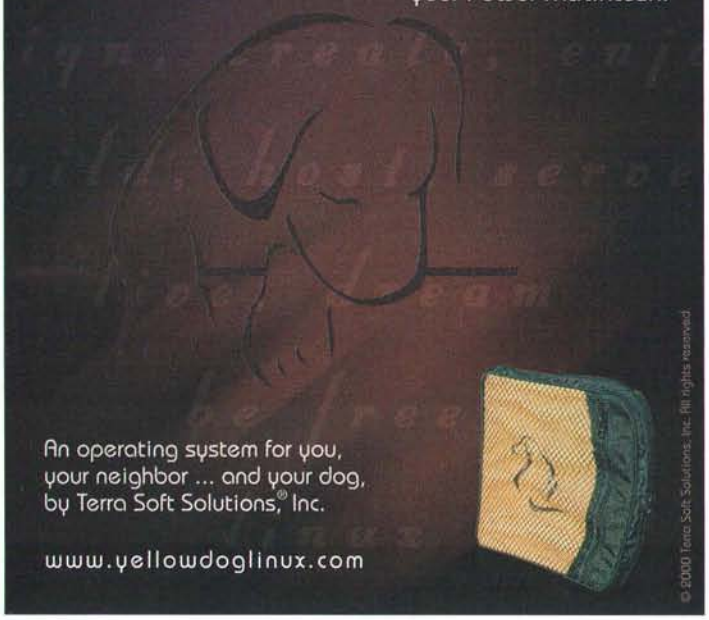

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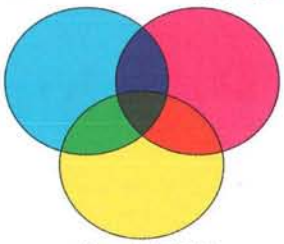

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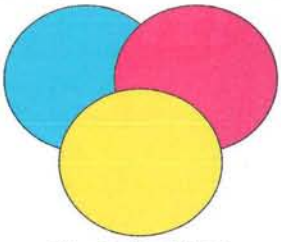
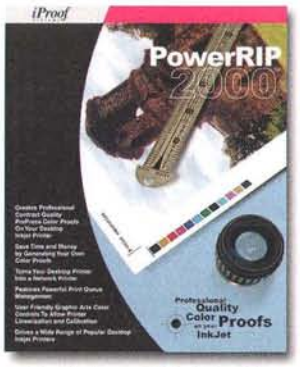


Other PostScript RIPs
Don't Show Illustrator 8.0 Overprinting



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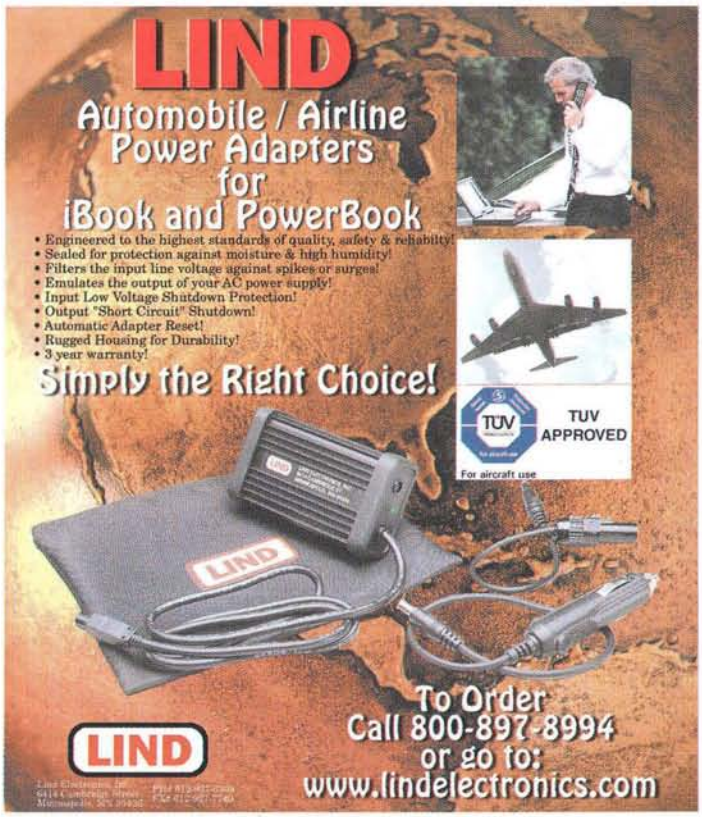

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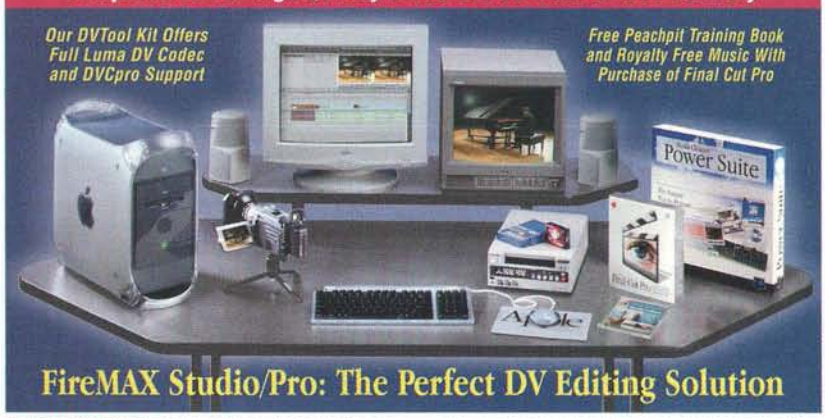

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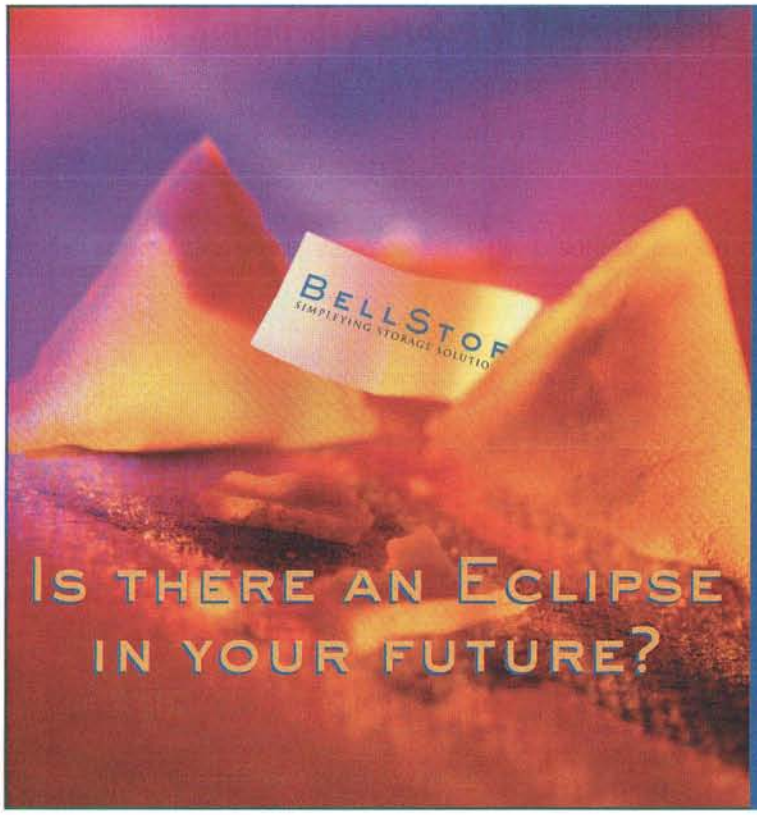

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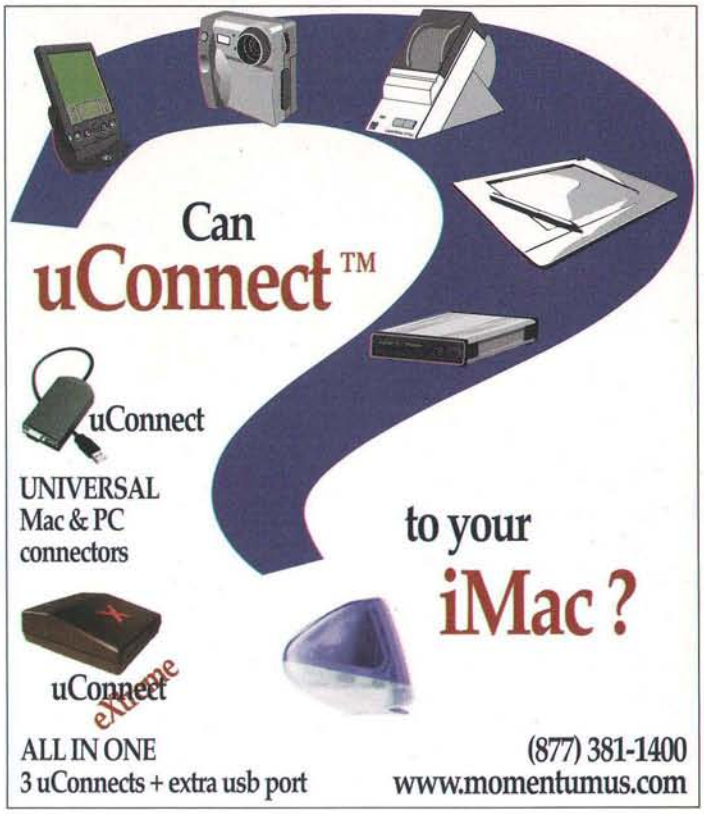

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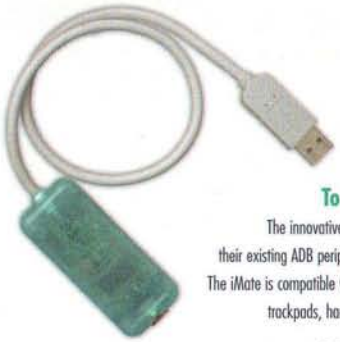

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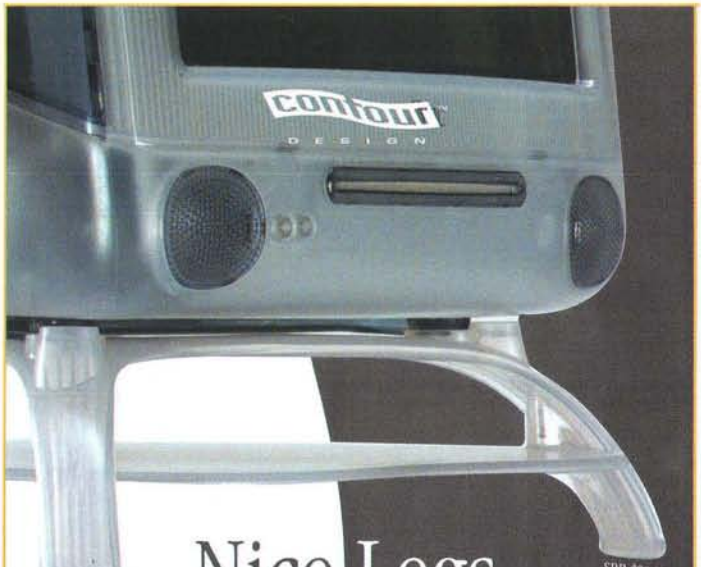

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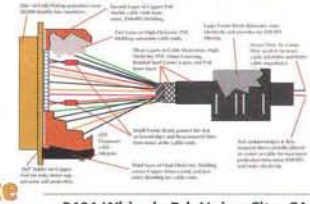

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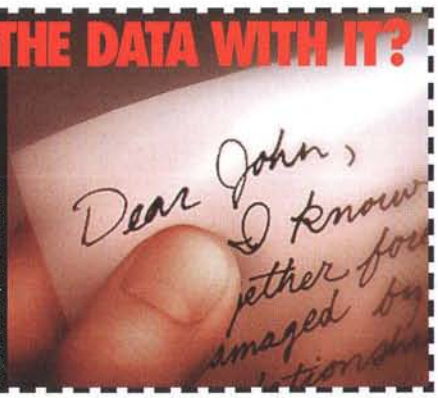

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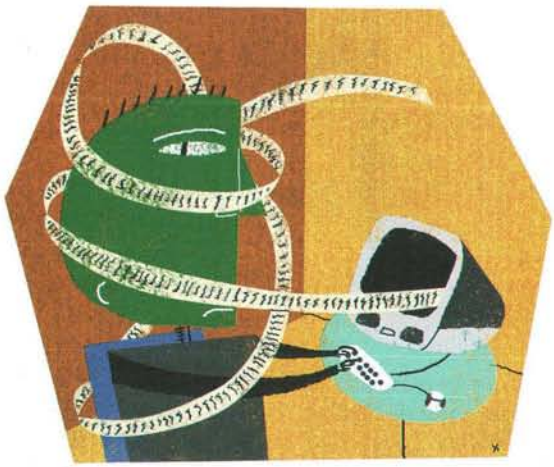

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